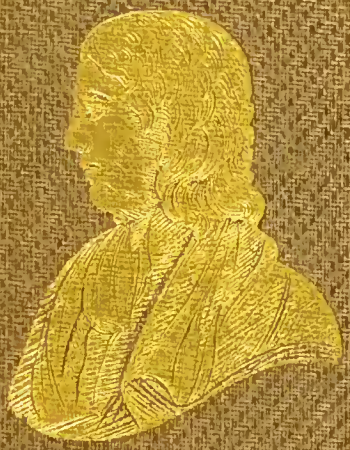

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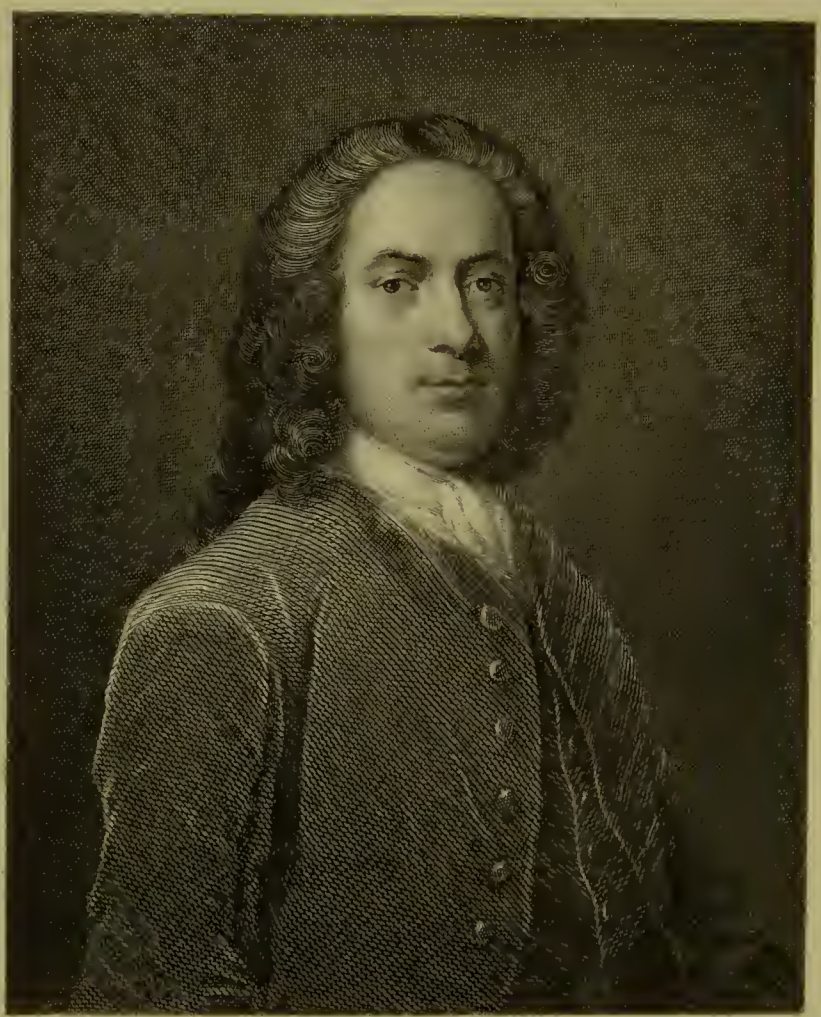

Engraved by F. Aveline from a Picture

Wm Smellie. M:D:

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SMELLIE'S TREATISE

ON THE

THEORY AND PRACTICE

OF

MIDWIFERY.

EDITED, WITH ANNOTATIONS,

BY

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EDITOR'S PREFACE.

In May, 1875, Mr. Jonathan Hutchinson wrote me a very courteous letter, asking, on the part of the Council of the New Sydenham Society, whether I would edit—for publication by the Society—Smellie's 'Midwifery,' introducing such comments and annotations as I should think proper. After some hesitation, arising from a distrust of being able worthily to execute the task, I consented to undertake it, as I had long been of opinion that a new edition of this admirable treatise with increased facilities for reference was a great desideratum. I soon found that the task was more troublesome than I had imagined, and that with my manifold engagements, and the limited time allowed for the completing of the work, it was almost presumptuous in me to attempt doing that which two other, and far abler men, had relinquished after they had severally undertaken it.

In the notes which I have introduced, no one plan has been followed: some are critical, some explanatory, some historical; but by far the greatest number are practical. Upon the anatomical and physiological chapters I have

purposely offered very few comments: Smellie's reputation is not specially connected with these subjects, and my own experience and reading little qualified me to speak on them; moreover, there really was not time for making the researches which such notes would require.

In order to render the finding of any particular subject easy to the reader, I have enlarged the table of contents, have numbered the cases consecutively, and have added a very full index, which will appear at the end of the third volume. I trust I have thus succeeded in remedying what were felt to be serious defects in all previous editions.

Although fully conscious of my incapacity to properly annotate the writings of such a master as Smellie—whom we must regard as one of the most skilful practitioners of the art, as well as one of the most illustrious founders of the science—of midwifery; still, I confess, the task has been a congenial one; and I esteem it an honour for my name to go before the obstetric world associated in any way with that of William Smellie.

The present volume contains the purely preceptive part of Smellie's treatise,—the subject-matter, in fact, of his lectures. The second and third volumes will contain his cases and clinical observations, which exhibit his practice and opinions on very many points of great interest to the obstetrician.

The engraving which forms the frontispiece does great credit to the artist, Mr. Anderson, for its execution and finish. The history of the remarkable portrait from which it is taken will be found at page 7.

It is very many years since an edition of Smellie's works issued from the press. All the editions published subsequently to 1763—the year of his death—are mere reprints, and nothing more. The copy, the text of which I have followed, was published at Edinburgh in 1788, and was printed under the supervision, it is supposed, of Professor A. Hamilton, who, the year before, had brought out an edition of Smellie's plates in octavo.

I cannot close this prefatory note without expressing my warm acknowledgments to Dr. Matthews Duncan for the great assistance he rendered me in collecting materials for the memoir of Smellie, as well as for his prompt and effectual services on every occasion on which I sought his help during the progress of the work. To my highly valued friend Dr. Fleetwood Churchill I also owe a large debt of thanks. But for his encouragement and kind promise of coöperation, I would hardly have ventured on the undertaking.

MEMOIR OF

WILLIAM SMELLIE, M.D.

BY THE EDITOR.[1]

As a teacher, author and practitioner, there is no British obstetrician—certainly none of the eighteenth century—who deserves so high a place in our estimation as William Smellie. Nay, more, under whichever of these several aspects we may regard him, he scarce has an equal. Whilst of all the men, British and foreign, who have most largely contributed to the advance of sound obstetric knowledge, Smellie may justly stand in the foremost rank. No accoucheur, ancient or modern, unfolded so many of the principles of true obstetric science, and in his practice so consistently acted up to them.

William Smellie was a native of the same county, Lanarkshire, which was the birthplace of Cullen and William Hunter. He was born most probably in the town or immediate neighbourhood of Lanark, some time in the year 1697.[2] Of his early life and medical

[1] The materials out of which this sketch (for it is no more than a sketch) has been composed were very scanty: and on several points of interest in Smellie's life, information is still wanting. The sources from which I have compiled are, Smellie's own statements, scattered through his writings; Hutchinson's 'Biographia Medica;' Dr. Maurice Onslow's short sketch in 'London Medical Repository,' vol. xv; Foart Simmons's 'Life of William Hunter;' Thompson's 'Life of Cullen;' Siebold's 'Geschichte der Geburtshülfe;' Sir James Simpson's address before the British Medical Association; and personal investigations made at Lanark by Dr. Maxwell Adams, of that town, and by myself, in July, 1875. To Dr. Adams, as well as to Dr. Matthews Duncan, I am greatly indebted for the effectual aid they most freely rendered to me when pursuing these inquiries.

[2] A writer in the 'Ed. Med. and Surg. Jour.,' vol. lxix, p. 414, describes Smellie as being "a native of Lesmahagow, in the upper ward of the same county,"—Lanark; but a careful search in the registry of that town failed to discover his name.

education nothing is known nor even where he obtained his medical degree.[1] He appears to have started as an apothecary in the town of Lanark, and in this capacity he began medical and obstetrical practice about the year 1720.

Dr. Maurice Onslow, in his sketch of Smellie written in 1821, states he had heard that Smellie began life as a surgeon or surgeon's mate in the navy, but he does not vouch for the truth of this, and I am strongly inclined to discredit it altogether, as Smellie could only have been 22 or 23 years of age when he commenced general practice at Lanark.

Of Smellie's life at Lanark, Simpson thus writes: "While settled at Lanark he did not succeed, as we learn from one of his subsequent detractors,[2] in getting above the position of second medical practitioner in that small community, and I have seen some of his accounts showing how miserably small his fees were. In fact he eked out his scanty income by keeping a shop as a village cloth merchant as well as by practising as a village doctor.[3] But in those long ordeal years he was busy in self-instruction, and especially in reading such medical books as he could manage to borrow or afford to buy. In a letter to Baillie Cullen, 'surgeon in Hamilton,' he writes, "I have kept your book on Consumption too long, but I shall send it next week. Send me up Dr. Clifton's history of Medicine, I want to see something in him. I could not get that book from Glasgow or Edinburgh, but I have sent to London for it." What induced him to leave Lanark I know not. The story goes that after disappearing from Lanark for a few years, and in the interim studying under Gregoire, at Paris, he astonished at last his

[1] The registers of the Universities of Edinburgh, Glasgow, St. Andrew's, Leyden, Utrecht, and Aberdeen, have been examined with a negative result; but I have been informed that the registry of St. Andrew's is defective for some years about the time when Smellie's name would appear in it; so that he may have taken his medical degree in this university, and from not finding his name elsewhere, I am disposed to think that he did.

[2] The only authority for this statement is Dr. William Douglas, the writer of a coarse scurrilous letter to "Dr. Smelle"—so he calls him—in 1748. I shall again have occasion to refer to it, and to the correspondence arising out of it.

[3] This story of Smellie having kept a cloth shop at Lanark, is borrowed, I presume, from Dr. John Thompson; but the only authority he gives for it is, that he "had been told" it (see his 'Life of Dr. Cullen,' vol. i, p. 18). This author also gives a copy of the letter from Smellie to Baillie Cullen, quoted by Simpson.

friends at home by sending them word he was alive and a thriving doctor in London. That there was any long interval between his leaving Lanark and settling in London, is quite at variance with Smellie's own statements. For example, in the preface to the second volume of his midwifery, he writes "Between the years 1722 and 1739 while I practised in the country I took notes," &c. Again in case 303, we find him saying, "In 1738, the year before I settled in London, a midwife sent for me to assist in a labour," &c. At the same time there is some collateral evidence (which I shall just now mention) to favour the idea that after leaving Lanark and before taking up a permanent residence in London, he may have spent some months in travelling and attending the obstetrical lectures of Gregoire at Paris. The grounds for this supposition are, that I find only one of his recorded cases to have happened in 1738 (case No. 303), and that there is no case bearing the date of 1739.

The Register of Seizins for the Royal Burgh of Lanark record different purchases of land by Smellie. The first of these was in 1728, when he is described as "Apotheeary," and that Eupham Borland was his spouse. Again under date of May, 1736, another entry occurs in which he is still designated "Apotheeary;" whilst in May, 1742, the register styles him "Doctor." It is fair to conclude from these quotations that some success attended Smellie in Lanark, and that he was not driven away from it through poverty; and further, that he obtained his medical degree some time between 1736 and 1742.

From the very outset he seems to have devoted himself with great earnestness to midwifery practice, "taking notes," he says, "of all the remarkable cases that occurred," and in proof of this we find that the dates of his cases commence from the year 1722 (*vide* Nos. 29 and 382), at which period he could only have been a short time practising. He remained at Lanark, as we have seen, in the active pursuit of his profession until the year 1739, when he changed his residence to London. Why he ventured to take so bold a step we have not the means of knowing positively, but the observations he makes on case 186 supply us with some clue to the circumstances which induced him to settle in London as a teacher and practitioner of midwifery, and these I shall now advert to. In the beginning of his practice he knew nothing of the use of the forceps, Chapman's treatise (the first to give instruction about it) not being then published, nor for some years afterwards. Consequently he was often

obliged to resort to instruments of a destructive kind to the child, and this, he tells us in case 186, gave him "great uneasiness," and in order to avoid this "loss of children," he "procured a pair of French forceps, described by Mr. Butter in the 'Medical Essays,' vol. iii. (This instrument was none other than the forceps of Dusé, pictured by Mulder, tab. 1, fig. 8, Butter's description of which appeared in 1733, the same year that Chapman's work issued from the press.) He afterwards studied the treatises of Chapman and Giffard (1734), but not satisfied with that, he "actually made a journey to London in order to acquire further information on this subject;" but he adds, "here I saw nothing was to be learned." The only teacher of midwifery at that time in London was either Maubray or Manningham; and Smellie's observation is certainly not complimentary to the teaching then pursued. Being thus disappointed in London he next proceeded to Paris (where Gregoire was then lecturing), and made a stay of about three months. There likewise he was "much disappointed in his expectations." Being dissatisfied with Gregoire's manner of instructing, Smellie goes on to say, "I considered that there was a possibility of forming machines, which should so exactly imitate real women and children as to exhibit to the learner all the difficulties that happen in midwifery; and such I actually contrived and made by dint of uncommon labour and application." He certainly does not mention the date of this trip to London and Paris, but I think we can be at no loss to fix it about 1739; for in case 281, which bears the date 1737, he tried and had reason to be disgusted with Butter's (or more properly Dusé's) forceps; it must therefore have been subsequently to this date that he resolved on going to London in search of information. This brings us so near the time, 1739, when we know he left Lanark, that it seems more than probable the cause of his leaving it was the eager pursuit of obstetric knowledge, and the effect of his visit to London and Paris was the strong conviction that he could introduce better and more effectual methods of teaching midwifery than any that were then known. Such then would appear to have been the reason of his selecting London as the place of his future residence, and so speedily commencing there to give courses of instruction in midwifery.

In the year 1741 (that is about two years after Smellie settled in London), William Hunter, then only three and twenty years of age, came to seek his fortune in the great city, and took up his abode

with Smellie. As they were both natives of the same county, Lanarkshire, it is more than probable they had some previous acquaintance. Mr. Pettigrew, in his 'Medical Portrait Gallery,' says that Smellie was at this time an apothecary practising in Pall Mall, but gives no authority for this; and I feel disposed to question the accuracy of the statement, since it must have been about this very time that Smellie began to teach midwifery; and moreover from the entry made on the fly leaf of some of the books in his library we know what *two* of his London addresses were, viz., Gerrard Street, and Wardour Street, St. Anne's, Soho, but not Pall Mall.

His success as a teacher must have been very great, for in ten years he had more than nine hundred pupils (exclusive of females), and gave 200 courses of lectures. This is the more remarkable, when we recollect that all these were voluntary pupils, attending his courses for sake of the information to be derived from them, and not for the "certificate" only, as is too commonly the case in the present day. He acquired at the same time considerable reputation as an accoucheur, and his private practice became "pretty extensive," as he himself expresses it. He continued teaching and practising till the middle of 1759, when he resolved to be released from the arduous professional duties which he had been discharging for nearly forty years. Having made over his class, museum, and teaching appliances to Dr. John Harvie, he left London and returned to his native county. The Dr. John Harvie here mentioned is doubtless the same who communicated cases 39 and 419. We know that Smellie's heir was a Dr. John Harvie who was married to his niece; and I think we may with every certainty identify this individual, as being the same Dr. John Harvie who was Smellie's successor in the lecture room and who sent him the accounts of the two cases just alluded to. There can be little doubt, also, that he was the author of a small work published in 1767, under the title of 'Practical Directions showing a method of preserving the Perineum in childbirth,' &c. I have never seen this book, so I can say nothing of its contents. I saw in Smellie's library at Lanark a printed copy of the syllabus of Dr. Harvie's course of lectures "At his house in Wardour Street, Soho, London." It bears the date of 1763 and the number of lectures comprised in the course was seventeen.

After he took up his residence near the town of Lanark, Smellie employed his leisure hours in methodising and revising his papers, and in finishing the collection of cases which form the last volume of his

'Midwifery;' the three volumes having appeared consecutively with intervals between. He only just lived to complete this great work, but not long enough to see it all in print. At the request of Dr. Matthews Dunean, careful inquiry was made by Dr. Maxwell Adams, of Lanark, for Smellie's grave in the burying ground of the old Kirk of St. Kentigern adjoining that town, and after a "long search" he succeeded in finding it: over the grave is a "table stone" very much defaced, but "with some little difficulty," writes Dr. Adams, "the following inscription can be made out."

"This is Doctor William Smellie's burial place, who died March 5th, 1763, aged 66.

"Here lyes Eupham Borland, spouse to the said Doctor Smellie, who died June 27th, 1769, aged 79."

I visited the churchyard in July, 1875, in company with Dr. Adams, and confirmed in every particular the accuracy of his reading of the inseription on the tombstone.

Smellie's wife was seven years older than himself and they died without issue. His house, whieh is elose to the town, remains and is inhabited. The place was named "Smyllum," after him or his family, and this name it still retains. To the sehool at Lanark he bequeathed the sum of £200, and all his books, maps, and pamphlets "for to begin a library there." He also left to the said school "nine English floots with the thiek 4to gilt music book:" also "for the library room," the three pictures in his study, viz., his father's, mother's and his own, drawn by himself, 1719. Further, "to accommodate readers I leave for their use to be in the foresaid room, my large reading desk, with the table flap that hangs to it, and stands in the lobie, with the leather chair, and smoaking little chair, in the study, as also the high steps there to take down the books, which must be contained in locked tirlised doors." Further on he adds—"after a more deliberate consideration, and as my collection of medical books are pretty complete, both as to the ancient and modern practice, and may be of use to medical gentlemen in this place to improve and consult, on extraordinary emergencies, I also bequeath all of them to the foresaid library and along with them two printed books on the composition of musie and a manuscript one."

The library, considerably redueed, is still extant under lock and key, but the books as might be expeeted are in a terrible state of dust and decay. I have examined the original catalogue of this

library: it contains the titles of about 300 volumes, consisting of works on anatomy, medicine, midwifery, history, music, and general literature. Some of these are in French, some in Latin, and the rest English. The collection of works on midwifery, as might be expected, was very considerable, and included all the standard treatises of that day, and many of the old authors. Were we to judge of the man from his library, we might fairly say its owner was not only well read in his own special department, but was also a well informed man on general subjects, and therefore deserving of Mulder's epithet "doctissimus." "The portraits," "large reading desk with table flap," "leather chair," and "smoaking little chair," and "high steps" have not been seen for years and years. The portrait of Smellie "drawn by himself 1719" would possess a special interest for us, far beyond a Reynolds or a Kneller! It is some satisfaction, however, to know that the Royal College of Surgeons (Edinburgh) possesses a portrait of him. It was presented to that body in 1828 by Mr. John Harvie, writer to the Signet, an immediate descendant of Smellie's heir: and the then President of the College, Dr. David Maclagan, through whom the presentation was made, stated at the time that "besides being an excellent likeness of Dr. Smellie it possessed very superior merit as a painting."

At the request of Dr. Matthews Duncan this painting has been carefully examined by Mr. Jas. Drummond, R.S.A., of that city; and his authoritative opinion (which is corroborated by local and family tradition) is that it is "the original picture painted by Smellie himself and not a copy." If so, the value of the portrait is increased a hundredfold: and the College of Surgeons may well be congratulated on possessing not alone the only portrait extant of the greatest of British accoucheurs, but more than this, a portrait drawn by his own hand!

The face is that of a man in the prime of life, and at once suggests frankness of disposition and firmness of purpose, as salient traits in his character. A certain degree of dignity, with very great intelligence, is expressed in the countenance. Besides this portrait of Smellie, there is, at the College of Physicians, Edinburgh, a medallion likeness of him.

That Smellie must have been a close, accurate observer, as well as an industrious, painstaking man, of very methodical habits, is evident from his writings. To very extensive experience of obstetrics (in his time a rare thing), he joined a high degree of sagacity and

solidity of understanding—rare at all times. But in addition to this, he seems to have been thoroughly devoted to midwifery, and to have possessed qualities that eminently fitted him for practising it successfully. One of these was a strong natural taste for mechanics, which doubtless led him to improve the forceps, and to investigate with such remarkable success the physics of parturition. A contemporary and former pupil of his own tells us how he (Smellie) was distinguished "for an uncommon genius in all sorts of mechanicks, which, after having shewed itself in many other improvements, he manifested in the machines which he has contrived for teaching the art of midwifery." ('Answer to the late Pamphlet entitled a Letter to Dr. Smellie,' &c., 1748.)

The author of a pamphlet which appeared in 1773, entitled 'The Present Practice of Midwifery Considered,' the design and object of which was to decry man-midwifery, thus speaks of Smellie: "I knew him well—he was an honest man, and not only a faithful compiler of the doctrines and sentiments of other writers on the subject, but whatever he advanced as new and properly his own was founded on real facts and observation; and what ought still more to recommend him and enforce his authority with those of his fraternity, he was an enthusiast in his profession—man-midwifery was the idol of his heart; he believed in his forceps as firmly as he did in his Bible."

The indomitable perseverance he displayed in very many of his operative cases is most remarkable; and considering the strong popular prejudices then existing against instruments and male practitioners, it must have required no small degree of moral courage, and confidence in his own resources, to have acted as he did.

On different occasions he reviews his own practice with perfect candour, and freely confesses the errors he committed through want of judgment or unskilfulness. Thus, after describing a difficult case (No. 382) of turning in shoulder presentation, he observes: "By these efforts, and the exertion of great force, a considerable flooding was brought on; and this alarmed me not a little, especially as it was one of my first cases and I had not yet attained that calm, steady, and deliberate method of proceeding, which is to be acquired only by practice and experience. I had over-fatigued myself from a false ambition that inspires the generality of young practitioners to perform their operations in the most expeditious manner."

He is liberal in his acknowledgment of obligation to those who

aided him by their advice or suggestions; and to other authors and practitioners he fully accords the merits due to their advice or improvements. Thus, in his comments on case 186, he writes, "Nor did I reject the hints of other writers and practitioners, from whose suggestions I own I have derived much useful instruction. In particular I was obliged to Dr. Gordon, of Glasgow, and Dr. Inglesh, of Lanark, in Scotland; the first made me acquainted with the blunt hook, the other with the noose; and in London Dr. Nisbet assisted me in improving the forceps, and Dr. Hunter in reforming the wrong practice of delivering the placenta." Again he adds, "I took all opportunities of acquiring improvement, and cheerfully renounced those errors which I had imbibed in the beginning of life." This is corroborated by the testimony of one of Smellie's old pupils: "No man is more ready than he to crave advice and assistance, when the least danger or difficulty occurs; and no man more communicative without the least self-sufficiency or ostentation."

That he was a close observer and correct interpreter of nature, all must admit. But, more than this, he seems to have been actuated with a sincere desire for the advancement of his art, and to have been free from all narrow-minded or selfish prejudices in favour of his own improvements. If any man had reason to be proud of his skill in the use of the forceps, and of the perfection of the rules he had deduced for its employment, that man was Smellie; and yet we find him remarking: "From what I have said the reader ought not to imagine that I am more bigotted to any one contrivance than to another. As my chief study hath been to improve the art of midwifery, I have considered a great many different methods with a view of fixing upon that which would best succeed in practice," &c. And again, after pointing out the inutility of the lack or fillet, and its vast inferiority to the forceps—an opinion fully endorsed by all succeeding experience—he adds, "but let not this assertion prevent people of ingenuity from employing their talents in improving these or any other methods that may be safe and useful; for daily experience proves that we are still imperfect and very far from the *ne plus ultra* of discovery in arts and sciences; though I hope every gentleman will despise and avoid the character of a selfish secret-monger." Such language bespeaks a candid and philosophic mind, as well as a modest estimate of the important services he had rendered to operative midwifery.

Smellie was said to have been a man of shallow acquirements;

but that he was not an ignorant man (as Burton insinuated) is very certain. Besides the proof his works afford of knowing the literature of his profession, his attendance on the lectures of M. Gregoire, at Paris, indicates that he was acquainted with French; and we find the English translator (Tomkyns) of Lamotte publicly expressing in the preface his acknowledgments to Smellie for "comparing the translation with the original." Though his style of writing is plain and devoid of elegance, still it possesses the great merit of perspicuity, and his clinical histories are terse and graphic. That he may have been distrustful of his own capacity as an author is very probable, but this cannot be taken as any proof of ignorance. He confesses to having submitted his writings to the revision of a friend, and it is supposed that this friend was no other than Smellie's own countryman, the celebrated Tobias Smollett—the same, I presume, who communicated the case (No. 2) in vol. ii of the 'Midwifery.' This case is dated 1748, and it was not long afterwards, viz., in 1750, that the author of 'Roderick Random' took out his M.D. at Marischall College, Aberdeen. Had Smellie been an ignorant, illiterate man, it surely is not possible he could have become so eminent as a teacher, and have attracted such numbers of pupils to his class-room. But we are not doing full justice to Smellie's acquirements, if we only say he was well versed in the literature and practice of midwifery; have we not good evidence before us that he also cultivated the muses, and had made proficiency in music and painting?

Smellie was not exempt from the lot of all reformers and discoverers. There were many of his contemporaries who envied his fame and success, and therefore tried to sully the one and lessen the other. His professional reputation and character were freely assailed from various quarters; but he showed himself very indifferent to the imputations that were cast upon him, insomuch so that a friend and *quondam* pupil of his own—Dr. Giles Watts—rather complains of Smellie's not having vindicated himself from Burton's charges. Perhaps the bitterest of his slanderers was Mrs. Nihell, a celebrated midwife, who lived in the Haymarket; but by far the ablest and most persevering of Smellie's detractors was Dr. John Burton, of York—better known to the world under Sterne's designation of Dr. Slop. A Dr. William Douglas, who styles himself "Physician to His Royal Highness the Prince of Wales' Household, and Man-Midwife," was another virulent assailant of his, but I

merely mention his name to point out that he was *not* the Douglas after whom Douglas' space is called, and under whom William Hunter began his brilliant career in London; this was Dr. James Douglas, a distinguished anatomist and accoucheur, and the friend of Cheselden; nor yet was he the Douglas who wrote on 'Rupture of the Uterus,' for his name was Andrew. The only title to fame of this William Douglas is that he wrote against Smellie, for his letters are full of nothing but offensive observations and vulgar abuse of Smellie's person, practice, and character. Among other things Douglas charges Smellie with having "a paper lantern, wrote upon, *Midwifery taught here for five shillings.*" In his answer, Smellie completely vindicates himself from the imputations of malpractice and unprofessional conduct, but takes no notice of the lantern.

It would, I think, be unprofitable to enter further upon this subject. No one supposes that Smellie was infallible, or that his works are free from errors and inconsistencies; that they contain so few, is what we must admire.

I have said that he himself took little notice of these flippant scribblers, but his friends were not equally apathetic. Giles Watts, in his 'Reflections upon Slow and Painful Labours' (1755), warmly defends Smellie and censures Burton very severely for his 'Letter to Smellie,' and boldly charges him with "trifling cavillings, wilful misrepresentations, scandalous plagiarism, unfair argumentation, and abusive language," and finally, Watts declares himself "ready, if called upon, to prove the truth of the above assertions." That Watts was not a blind worshipper of Smellie is shown by his stating "that Dr. Smellie has made several, and some of them pretty considerable mistakes," and that his treatise "contains some few inconsistencies and inaccuracies which are almost entirely unavoidable in a work of that length." But after all, the ablest vindication of Smellie was effected by time, and proclaimed by the unanimous voice of posterity.

In appearance and manner Smellie would seem to have been unprepossessing and awkward. He is described by William Douglas as "a rawbon'd, large-handed man." The same writer ridicules his "monstrous hands fit only to hold horses by the nose whilst they are shod by the farrier, or stretch boots in Cranbourne Alley." Smellie alluding to this part of Douglas' vituperations, says—"But if Dr. Douglas had perused La Motte's 'Midwifery' he would not

(probably) have exclaimed against my hands which (by-the-bye) are none of the largest. That French author ridicules the objection and confirms his arguments by bringing in the example of Mingot, who was one of the most famous accoucheurs in Caen, and whose hands were remarkably big." When midwifery was a less perfect art than it now is, and when, consequently, force often took the place of skill, a strong hand and arm were very valuable to the accoucheur. A most eminent and successful accoucheur of this city (Dublin), in the early part of the present century, got the nickname of "big-paw," on account of his immense hand, which the author of a lampoon declared was "only fit to scrape out the crater of a volcano."

We have seen that Smellie began lecturing a year or two after he settled in London, *i. e.*, about 1741. Though not the very first, yet we may claim for him to have been among the earliest teachers of midwifery in Great Britain, and, without doubt, the style and matter of his lectures far surpassed the two men (and only two) who preceded him in this path. Dr. John Maubray (author of 'The Female Physitian,' and 'Midwifery brought to Perfection by Manual Operation') is reputed to have been the first lecturer on midwifery in Great Britain (Denman). He gave lectures at his house in Bond Street, about 1724. Somewhat about this time lived Sir Richard Manningham. He established in 1739 a ward in the parochial infirmary of St. James', Westminster, for the reception of lying-in women only, which was the first of the kind in the British dominions. At this ward he gave lectures, and students had opportunities for being qualified for practice. He died about 1750. I possess a copy of his 'Abstract of Midwifery, for the use of the Lying-in Infirmary,' which is nothing more than a very lengthy and prolix syllabus of his lectures.

Dr. Young, of Edinburgh, gave private courses on midwifery about 1750, and was elected professor in 1756.[1] He had two predecessors, but Dr. Malcolmson says neither of them lectured on midwifery. I possess a printed copy of his syllabus of "*A Course of Lectures upon Midwifery; wherein is contained a history of the Art with all its Improvements, both ancient and modern,*" Edinburgh, 1750. The number of lectures contained in the course was twenty-two, and the fee for attending it two guineas: for being

[1] The following clever and witty epitaph on this Dr. Young, I believe, was copied from an old work entitled 'Anthologia Hibernica' (see opposite page):—

present at a real labour each gentleman paid five shillings, and "half a guinea when he delivers." The first lecturer on midwifery in Dublin was Dr. John Charles Fleury, physician to the Meath Hospital. He began lecturing about 1761, and continued to do so for eight years. He attended with his class poor women in their labours, for he strongly maintained, that without clinical instruction, no one could ever learn practical midwifery.

Smellie's lectures soon attracted much attention, and a numerous class of pupils resorted to him. With regard to the remuneration for his lectures, Smellie had a great advantage over the medical teachers of our day, as each course consisted of twelve lectures only, and from a printed syllabus of his lectures now before me, dated 1748, I find his terms to have been as follows—"Those who engage for one course pay three guineas at the first lecture; for two courses, five; for two months or four courses, nine; for three months twelve; for six months, sixteen; and for a year, twenty." Besides this the pupils had to pay from five to ten shillings for each labour case they attended, and six shillings more to a common stock for the support of the parturient women. For the purpose of illustrating his lectures he had a "collection of fœtuses, together with other useful preparations collected from time to time for the information and improvement of students," and also a machine (or phantom as we call it nowadays), which was considered a marvel of ingenuity, for exemplifying the process of parturition and the different midwifery operations. A somewhat similar contrivance was used by Gregoire and gained him great celebrity as a teacher all over Europe; but Smellie completely eclipsed him by the great

Hic jacet
Qui Venerem sine Lucinâ
Lucinam sine Venere
Coluit.
Filios post mille
Reipublicæ datos
Sine liberis decessit:
Bella inter intestina
Forti manu,
Sed sine Marte,
Patriæ liberatoris nomen
Adeptus est.
An. æt. 57 jam juvenem
Decessisse:
Abi, Viator, et lege.

superiority of his phantom. In a pamphlet of 1750, entitled 'A short Comparative View of the Practice of Surgery in the French Hospitals,' &c., the writer gives a full description of the phantoms of Gregoire and Smellie. Of the former he says "'tis so rude a work that a common pelvis stuck into a whale without any embellishment would be as like nature as this machine which has been so much admired." It was made of basket-work covered with coarse cloth; the pelvis was human, covered with oil-skin; and a real fœtus was used, which seemed to be the only merit of the apparatus. Then he goes on to say, "Yet this machine, rude as it is, would probably have still kept its reputation, had it not been for the surprising genius of Dr. Smellie, whose machines are really curious: they are composed of real human bones armed with fine smooth leather and stuffed with an agreeable soft substance." Beyond a doubt the true secret of Smellie's great success as a teacher was the fact that from the outset of his career as such he combined clinical with oral instruction. In some of the cases related in his 'Midwifery,' we find him foregoing any fee from the patient on the sole condition that his pupils might be allowed to be present at the delivery. It seems highly probable that the establishment of maternity hospitals about this time, in London, for clinical teaching, was in some measure the fruit of Smellie's influence and example. Thus the British Lying-in Hospital was founded 1749; the City of London Lying-in Hospital, 1750; Queen Charlotte's, 1752; Royal Maternity, 1757; and the General Lying-in Hospital, 1765. The Dublin Lying-in Hospital had been founded some years earlier, viz. in 1745; one of the great objects of its founder, Dr. Moss, being that it might afford facilities for clinical instruction, and thus save students the necessity of resorting to Paris to learn this branch of the healing art.[1]

[1] Dr. Bartholomew Moss was in many respects a most remarkable man. His genuine philanthropy, farseeing wisdom, and extraordinary devotion to the great work which he initiated and completed, justly place him in the foremost rank of medical philanthropists. Moss was the son of a clergyman, and was born in the Queen's County, in 1712. He obtained his surgical licence at Dublin in 1733. He opened a small maternity hospital, in a house hired for the purpose, in March, 1745, the expenses of which were defrayed chiefly out of his own pocket. Three years afterwards he purchased the site of the present lying-in hospital, which was not completed till 1757, when it was opened and the patients were transferred from the temporary hospital in South George's

Among the pupils who learned midwifery from Smellie we cannot doubt but that William Hunter was one, as he lived for some time with Smellie on first going to London, and was his junior by over twenty years. In one of the cases (No. 408) related in his 'Midwifery' Smellie states that "Dr. Hunter was present and assisted at the operation." Dr. David McBride of Dublin was another distinguished pupil of his; and I have his original certificate from Smellie and his MS. notes of the twelve lectures comprised in a course; as well as the printed syllabus.[1] Denman also studied under him ('Gentleman's Magazine,' vol. 85, part 2, p. 566). Another illustrious pupil of Smellie's was John George Roederer, afterwards Professor of Midwifery at Gottingen and author of 'Elementa artis obstetriciæ.'[2]

Street. Moss died in 1759. His highest eulogy is contained in the sentence under his bust at the hospital:—*Miseris solamen instituit.*

Without fortune, without influence, without patronage, without precedent, he conceived the project of affording relief to a certain class of the community; and with extraordinary energy, prudence, and perseverance, by never relaxing, never despairing, he carried it into execution. A most interesting memoir of him, by Sir William R. Wilde, will be found in the second volume of the 'Dublin Quarterly Journal of Medical Science,' p. 565.

[1] Dr. McBride was an eminent practitioner of medicine and midwifery in Dublin during the middle of last century. He was born in the County Antrim in 1726, and died at his residence, Cavendish Row, Dublin, in 1778. He published several original essays on subjects connected with chemistry, and especially pneumatic chemistry, in which department he made some valuable discoveries; and was the author of a large treatise on the 'Practice of Medicine.' As an accoucheur he was much employed, and his fee book shows that he attended 1065 midwifery cases from 1767 to 1777, inclusive. As I have elsewhere mentioned, Dr. McBride was the first British author to describe pudendal hæmatocele. He also gave lectures on the practice of physic at his own house. Such was his reputation in Dublin as an obstetric physician, that he was elected a governor of the lying-in hospital in the year 1774, and requested by the Master and the Board to give lectures in the hospital upon midwifery and the diseases of women and children. Those of his first course were published in London in 1772, and were subsequently translated into Latin and published at Utrecht in 2 vols. octavo. (For a full account of the life and writings of this eminent physician, the reader is referred to the third volume of 'The Dublin Quarterly Journal of Medical Science,' p. 281).

[2] The first edition of this celebrated work appeared in 1753. This was followed in 1759 by a second edition, which was translated into French and published at Paris in 1765. This French translation contains fourteen en-

Smellie would seem not to have been endowed with those personal attributes in regard to appearance, manners, and address, which sometimes take the place of real ability, and prove a passport to eminence among persons of wealth and quality. He is said to have been coarse in his person and awkward and unpleasing in his manners, "so that he never rose into any great estimation amongst persons of rank." Dr. W. Douglas's description of Smellie I have already quoted, but we must bear in mind that it is only the exaggerated language of a bitter opponent.

When Sir Richard Manningham, Dr. James Douglas, and Dr. Sandys had passed away, William Hunter rapidly gained the highest place as an accoucheur in public estimation. In accounting for this his biographer, Foart Simmons, thus speaks: "He (Hunter) owed much to his abilities and much to his person and manner, which eminently qualified him for the practice of midwifery and soon gave him a decided superiority over his countryman Smellie, who to the weight of great experience united the reputation he had justly acquired by his lectures and writings." Alluding to this very point, the author of the 'Eloge' upon William Hunter, in the Académie Royale des Sciences, bears high testimony to the sterling honesty of Smellie's character. He writes—"M. Hunter se livra principalement à la pratique des accouchemens, bientôt il n'eut qu'un rival à Londres. Heureusement pour sa fortune, ce rival, M. Smellie, n'avoit pas joint à ses talens l'art de se rendre agréable à un sexe qui, accoutumé au language de la flatterie, est étonné d'entendre celui de la vérité, même dans la bouche de son Médecin, voudroit qu'il s'occupât de plaire encore plus que de guérir, et sans doute est excusable de le vouloir; car les défauts des femmes sont l'ouvrage des hommes, comme les vices des nations sont le crime de leurs tyrans. On craignoit le Docteur Smellie, on attendoit pour l'appeler, que son secours fût absolument nécessaire, c'est-à-dire qu'il fut inutile. Il avoit donc rarement des choses consolantes à

gravings, all of which, with one exception (a drawing of a lying-in chair), are well executed fac-similes of plates in Smellie's collection, but reduced to the size of an octavo page. The lettering and explanations of these plates are borrowed from Smellie. I have failed to discover in the book any acknowledgment of the source from which these plates were obtained. Roederer's second edition contained no plates of any kind. The translator's name is not given; the title-page merely states "traduits sur la derniere Edition par M. * * * *, avec figures," which would imply that the translator introduced the "figures."

dire, et on l'en craignoit encore davantage; aussi n'eut il jamais une pratique étendue dans ce qu'on appelle la bonne compagnie, et il fut très-heureux pour les Dames Angloises, que M. Hunter unit à une habileté pour le moins égale, la douceur et les agrémens dont l'austère et savant Smellie avoit été privé." ('Histoire de L'Académie Royale des Sciences,' Année 1783, p. 31.) Dr. James Douglas, the early patron and friend of Hunter, had gained considerable reputation in obstetric practice, and this circumstance probably directed Hunter's attention to the same department, especially as he had no liking for pure surgery. Dr. Douglas died in April, 1742, aged 66.[1] In 1748 Hunter was elected one of the surgeon men-midwives to the Middlesex, and soon afterwards to the British Lying-in Hospital, and this also assisted in bringing him forward as an accoucheur.

Besides the great benefits which Smellie conferred upon midwifery as a science, by his teaching and writings, he also rendered valuable service to it as a profession by helping to overcome the strong prejudices then existing in the public mind against male practitioners and the employment of the forceps. This he did by the weight of his character not less than by his forbearance and good temper. He frequently came into collision with midwives and other strenuous opponents of the obstetric surgeons, and he seems to have acted on all these occasions with such sound judgment and discretion, as to subdue prejudice and win respect—making friends even of those who a little before were bitter enemies. In one case to which he was called, owing to a keen dispute having arisen between the attending doctors and midwives, he quaintly describes how by mildness and remonstrance he "brought them to a better temper and they were at last reconciled," and he adds, "Indeed I thought it always my duty to make up such breaches for the general good of society, as well as for the honour of the profession."

Attending patients with his pupils sometimes brought trouble upon him. For example, he was called at night to a labour in one of the narrow lanes in broad St. Giles, where the arm of the child presented: "When I came in," says the doctor, "the room was crowded with the pupils to the number of twenty-eight. Such a number going in had so alarmed the lane that a great mob assembled

[1] For some interesting particulars relating to this physician see p. 734, vol. ii, of Thompson's 'Life of William Cullen, M.D.'

and began to exclaim 'that we were trying practises.' Some of the women also told us that the parish officers were sent for, who at that time were glad of showing their authority. On these accounts I was obliged to deliver the woman in a hurry. The child was alive, and when this was told the mob, and that the woman was also safe, they all dispersed" (case 502).

Again in relating another case (319) he says, "Having sent for my principal midwife and the rest of my pupils, I desired her to keep the patient quiet in bed, which indeed was only a little straw laid in a cold garret; for at that time we were obliged to smuggle our patients on account of the barbarity of the churchwardens."

We can, perhaps, hardly realise the difficulties which beset a man in Smellie's position. To do so we must remember that he lived at the beginning of a new era and in that stage when a great transition was being effected. The practice of midwifery, so long monopolised by women, was changing hands and passing over to the surgeons and physicians. To this transfer the female practitioners, as might be expected, were strongly opposed, whilst patients themselves, as a general rule, were also decidedly averse to it. The fact of a surgeon being called in, Chamberlen tells us, was inseparably associated in the minds of women with the performance of some terrible operation, commonly ending in the death of mother or child, and this feeling was prevalent, Smellie says, in his day also. No wonder, then, that lying-in patients should have dreaded the appearance of the man-midwife at their bedside; and, such being the prevailing sentiment, we cannot attach blame to Smellie for laying down directions how to use the forceps "privately," and without the patient's knowledge. The discovery of the forceps doubtless contributed to dispel this deep-rooted notion; and its judicious employment proved eminently serviceable to the cause of male practitioners, as well as to parturient women. Smellie was endowed with qualities and possessed of attainments which peculiarly fitted him to aid in the revolution that was taking place. His sound judgment and great experience, together with his command of temper and discreet behaviour, could not fail to commend his profession to public confidence, and I am fully persuaded that we are more indebted to him than to any other single individual for bringing about this much needed reformation.

At the time Smellie published his famous treatise he had been over thirty years practising midwifery, and, besides his private practice, which was very considerable, he had attended with his class

1150 poor women in labour. He had, moreover, been actively engaged in teaching obstetrics for ten years. Six years were spent preparing the first volume of his work for publication, the contents of which were based on the matter of his lectures. When he tells us in the preface to this volume that "it was not cooked up in a hurry," he makes a very modest assertion; for beyond a doubt there have been very few medical authors who, on their first appearance as such, possessed so matured a judgment and so ample an experience as he did. His second and third volumes are taken up with the histories of cases (of which there are 531), interspersed with observations and practical comments. In thus separating the clinical narratives and putting them by themselves, he admits that he follows the plan of Mauriceau, and no doubt this plan has some advantages. The cases are not promiscuously disposed, but are carefully classified and distributed into groups or "collections," with subdivisions, all being grouped with a strict regard to systematic arrangement. In each collection reference is given to the particular part of the first volume which the cases are intended to illustrate. In the three great divisions of his work—viz. the principles, the cases, and the plates—reference is constantly made to the particular part in the two other divisions where the same subject is brought forward, thus enabling the reader to pursue the study of each subject in connection with the clinical and pictorial illustrations relating to it. This arrangement is excellent, and gives a coherence and unity to the whole work, but is very inconvenient for reference, and must have imposed a good deal of additional trouble on the author. Smellie, however, was a man who seems to have thought nothing of trouble.

As already stated, Smellie was a keen and accurate observer of nature, and exercised the utmost care in obtaining correct data on which to found his conclusions. Here was the secret of his unrivalled success as a reformer and improver of midwifery. He acknowledges this himself, for in reviewing his practice (Case 186) he writes, "In a word, I diligently attended to the course and operations of nature which occurred in my practice, *regulating and improving myself by that infallible standard.*"

He did not start with any preconceived theory, and then endeavour to make facts square with its requirements; but he observed first, and reasoned afterwards; and it was from neglecting this inductive method that the art of midwifery remained so long in a barbarous condition.

Up to his time there prevailed in the works of most of the Continental writers "a tendency to exalt theory at the expense of fact," as Leishman expresses it. But the eminently practical nature of Smellie's work, the clear and consistent principles which he unfolded, "had the result of turning the minds of his Continental contemporaries into that more practical channel, by a close adherence to which they were at length enabled to add to and to develop" his views and observations; but, little was left them to correct or to alter, of what he did, such was the accuracy of his observation and the fidelity of his description.

He cleared away an immensity of the rubbish and superstition which enveloped the whole theory and practice of midwifery, and he laid down the true principles on which obstetric science should be based. He corrected and extended our knowledge of the anatomy of the gravid uterus, and of the positions of the fœtus in utero; and he recognised with far greater distinctness than had been done before the successive steps in the process of natural labour. He was the first to investigate accurately the shape and measurements of the female pelvis and the shape and dimensions of the fœtal head, paying special attention to the pelvic diameters in which the head moves during its passage through this cavity. Thus he made a great advance in our knowledge of the mechanism of parturition, on the solitary but important fact discovered by Fielding Ould. His observations on all these points tended to revolutionise the art of midwifery, and were brought to bear on the mode of applying and using the forceps; and accordingly we find him laying down admirable rules for guidance in this matter—rules based upon definite principles and far surpassing all those hitherto set forth.

"To Smellie we owe what were until very lately the best types of the long and short forceps, as well as the clearest directions for using them 'on rational and mechanical principles.' Nay, on comparing his writings with those of his successors for upwards of eighty years, we find that when, in the course of time, Smellie's teachings were supplanted by those of W. Hunter, Osborne and Denman, and even down to the date of Blundell's and Collins' works, midwifery retrograded." (T. Moore Madden, in 'Dub. Med. Journ.,' October, 1875.) On this point the great Baudelocque thus expresses himself:—"No one had more confidence in the forceps than Smellie, no one rendered them of more general use nor applied them more methodically or with greater success."

He considerably modified the form and dimensions of Chapman's forceps, and his joint or lock (universally known as "the English" or "Smellie's lock") for the blades of the instrument, was in itself a great acquisition, and is superior to any other mode of adaptation that has been invented. That it was really the invention of Smellie can hardly admit of question. Neither the forceps of Chapman or Giffard had such a mode of connection, and in his letter to "Mr. John Gordon, surgeon, at Glasgow, dated January 12th, 1747-8" (contained in the answer to Dr. W. Douglas's first pamphlet), Smellie says, "About three years ago I contrived a more simple method of fixing the steel forceps by locking them into one another, by which means they have all the advantages of the former kinds without their inconveniences."

Besides lengthening the forceps to suit special cases he added a second or pelvic curve, thus producing the long double-curved forceps. Whether he or Levret was the first to make this improvement, has been disputed, but Smellie was undoubtedly the first British accoucheur to recommend this form of the instrument.

In case 352 (A.D. 1753), Smellie tells us he completed the delivery by the employment of a long double-curved forceps, and he adds, "They were contrived some years ago by myself, as well as other practitioners, on purpose to take a better hold of the head when presenting, and high up in the pelvis; but I did not recommend their use in such cases, for fear of doing more harm than good by bruising the parts of the woman when too great force was used." Levret's treatise describing the double-curved forceps was published in 1751; but as his name is not mentioned in Smellie's introduction nor in connection with the long forceps, we may fairly conclude Smellie was ignorant of Levret's improvements in the instrument. Smellie's treatise was published two years before that of Benjamin Pugh, but the latter states that he invented a double-curved forceps fourteen years previously, and had always used it in preference to the short straight forceps.

The credit of adding the second, or pelvic curve to the forceps, has thus been claimed for Levret, for Smellie, and for Pugh. In the 'Dublin Medical Journal' for June, 1876, p. 564, I have given the results of my researches on this point, the sum of which amounts to this—that whilst Pugh, according to his own representations, appears to deserve the credit of priority in the construction and use of the double-curved forceps, yet that in the publication

of the improvement he was preceeded by Levret, and by Smellie, both of whom published in the same year (1751) their respective descriptions of the instrument in question. Smellie does not set up any claim for originality in the matter; he only says, "they were contrived by himself as well as other practitioners;" and neither he nor Pugh appears to have had any knowledge of what Levret had written upon the same subject. It is most probable, therefore, that, as in the case of many other inventions, the same idea had spontaneously and independently presented itself to different minds, and with each of them was truly original.

A few years after setting up in London Smellie made a wooden forceps, which he seems to have used on three occasions only, and then discarded. "The design of the wooden contrivance is to make them appear less terrible to women; besides, they are portable and make no clinking noise when used." Such are his own words in a letter to Surgeon Gordon, of Glasgow: and an allusion to the wooden instrument occurs in case 269. This wooden instrument was the ostensible ground of Dr. Wm. Douglas publishing a very abusive letter against Smellie, of which I make mention elsewhere.

Smellie advantageously altered the instruments used in performing craniotomy; devised the double crotchet, the sheathed crotchet, and the perforating scissors, which last was a very decided improvement on the instruments previously in use for this part of the operation, and is still preferred to the perforator, by many practitioners.

The great work on midwifery which has immortalised the name of Smellie, was published originally in three volumes, which came out at different periods. The first volume, containing the principles and practice of midwifery, as we would now say, though dated 1752, really issued from the press the latter end of 1751, and the critical notice of it appeared in the 'Monthly Review' for December of this year. A second edition of it appeared in 1752, which I have reason to believe was only a reprint; and a third edition was issued in 1754, along with Vol. II, which contained the first part of his collection of cases. Vol. III was published in 1764, about a year after Smellie's death. These two latter volumes are taken up with the cases (of which there are about 530), and the clinical observations thereupon. Several editions—eight at least—were published at London; besides others at Dublin, Edinburgh, and Philadelphia. Soon after its first appearance it was translated into French by M. Preville; into German (Altenburgh) by Zeiher and Königsdörfer; and into Dutch

(the first volume only) by Van der Hagen. The London publishers of the early editions were D. Wilson and T. Durham; but in the year 1779 a "new edition," in 3 vols., large 8vo, was published at London by Strahan, Cadell, and Nicol, in the Strand, and Fox and Hayes in Holborn, to which was "added a Set of Anatomical Tables with explanations." A fine copy of this edition is in the Library of the London Obstetric Society. The plates are those of Smellie, very well executed, but reduced in size; at the foot of each plate are the names of the publishers, and the date, "January 1st, 1779."

In 1754 Smellie published a volume of 'Anatomical Tables,' in atlas folio, designed to illustrate the anatomy of the gravid uterus, the positions of the fœtus, the progress of labour, obstetric instruments and operations, &c. Besides giving a description of each plate, it also contains a very concise abridgment of his obstetric principles and practice. There are thirty-nine of these engravings, all admirably executed. Twenty-six of them were engraved from drawings done by Mr. Rymsdyke, and in eleven others Smellie tells us he was assisted by Dr. Camper, Professor of Anatomy and Botany at Amsterdam. As we know that Smellie was an artist of no mean pretensions, we may infer that he himself took some part in the drawings that Camper "assisted him in." These plates have been universally admired for their accuracy and their execution; in which important particulars they far surpassed anything that had ever appeared before, and have seldom been equalled since. An octavo edition of these plates, engraved by A. Bell, appeared in the reprint of 'Smellie's Midwifery,' brought out at Edinburgh in 1783, it is supposed, by Professor A. Hamilton, and dedicated by him "To the Students of Midwifery and of the other branches of Medicine in the University of Edinburgh." A few years later, namely, in 1787, the plates just alluded to appeared in a separate form, in royal 8vo size, edited by Professor A. Hamilton, "with notes and illustrations adapted to the present improved method of practice." The plates are fairly executed reduced copies of the original folio plates. One engraving is added by Professor Young (of Edinburgh), representing his short double-curved forceps, Denman's perforator, a blunt hook, and female catheter. The editor's "notes and illustrations" are so few and unimportant as not to have been worth mentioning on the title-page.

AUTHOR'S PREFACE.

I AT first intended to have published this Treatise in different lectures, as they were delivered in one course of Midwifery; but I found that method would not answer so well, in a work of this kind, as in teaching: because, in the course of my lectures, almost every observation has a reference to the working of those machines which I have contrived to resemble and represent real women and children; and on which all the kinds of different labours are demonstrated, and even performed, by every individual student.

I have, therefore, divided the whole into an Introduction and Four Books, distinguished by Chapters, Sections, and Numbers; and have industriously avoided all theory, except so much as may serve to whet the genius of young practitioners, and be as hints to introduce more valuable discoveries in the art.

The Introduction contains a summary account of the Practice of Midwifery, both among the ancients and moderns, with the improvements which have been hitherto made in it; and this I have exhibited for the information of those who have not had time or opportunity to peruse the books from which it is collected; that, by seeing at once the whole extent of the art, they may be the more able to judge for themselves, and regulate their practice by those authors who have written most judiciously upon the subject. The knowledge of these things will also help to raise a laudable spirit of emulation, that never fails to

promote useful inquiries, which often redound to the honour of art, as well as to the advantage of society.

Though I have endeavoured to treat everything in the most distinct and concise manner, perhaps many directions that occur in the Third Book may be thought too minute and trivial by those who have already had the advantage of an extensive practice; but the work being principally undertaken with a view to refresh the memory of those who have attended me, and for the instruction of young practitioners in general, I thought it was necessary to mention everything that might be useful in the course of practice.

At first, my design was to have inserted cases, by way of illustration, according to the method of La Motte; but, upon further deliberation, I thought such a plan would too much embarrass the student in the progress of his reading; and therefore I have, in imitation of Mauriceau, published a second volume of histories, digested into a certain number of classes or collections, with proper references to the particular parts of this treatise; so that the reader, when he wants to see the illustration, may turn over to it at his leisure, according to the directions in this edition.

Those classes consist of the most useful cases and observations, partly culled from the most approved authors, but chiefly collected from my own practice, and that of my correspondents and former pupils, by whom I have been consulted.

Nor will the reader, I hope, imagine that such a fund will be insufficient for the purpose, or that this treatise is cooked up in a hurry, when I inform him, that above six years ago I began to commit my lectures to paper for publication: and from that period have from time to time altered, amended, and digested what I had written, according to the new lights I had received from study and experience. Neither did I pretend to teach Midwifery till

after I had practised it successfully for a long time in the country; and the observations I now publish are the fruits not only of that opportunity, but more immediately of my practice in London during ten years, in which I have given upwards of two hundred and eighty courses of Midwifery, for the instruction of more than nine hundred pupils, exclusive of female students; and in that series of courses one thousand one hundred and fifty poor women have been delivered in presence of those who attended me; and supported during their lying-in by the stated collections of my pupils; over and above those difficult cases to which we were often called by midwives, for the relief of the indigent.

These considerations, together with that of my own private practice, which has been pretty extensive, will, I hope, screen me from the imputation of arrogance with regard to the task I have undertaken; and I flatter myself that the performance will not be unserviceable to mankind.

It was my intention to insert in this Compendium plates of the most useful instruments appertaining to the art of Midwifery; but as large drawings could not be properly bound in a book of so small a size, I have exhibited them in a large folio, with thirty-six anatomical tables and explanations; and in this edition I have made proper references to these figures.

[This preface is nearly word for word the same as that which appeared in the first edition, and is the *ipsissima verba* of the preface to the third edition, which was issued in the year 1754, in two volumes, the second volume being the first part of Smellie's collection of cases. I happen to have in my possession Smellie's own interleaved, annotated copy of the first edition of his 'Midwifery.' On the title-page is written "The Third Edition, Vol. I." His corrections of the preface are very slight, and only of a verbal kind, having reference solely to the second volume and to the plates. The preface so corrected is identically the same as that contained in all the succeeding editions, which I have examined.]

INTRODUCTION.

It must be a satisfaction to those who begin the study of any art or science, to be made acquainted with the rise and progress of it; and therefore I shall, by way of introduction, give a short detail of the practice of Midwifery, with the improvements which have been made in it at different times, as I have been able to collect the circumstances, from those authors, ancient as well as modern, who have written on the subject.

By these accounts it seems probable, that in the first ages the practice of this art was altogether in the hands of women, and that men were never employed but in the utmost extremity: indeed it is natural to suppose, that while the simplicity of the early ages remained, women would have recourse to none but persons of their own sex to diseases peculiar to it; accordingly, we find that in Egypt Midwifery was practised by women.

Hyginus relates, that in Athens a law was made, prohibiting women and slaves from practising physic in any shape: but the mistaken modesty of the sex rendered it afterwards absolutely necessary to allow free women the privilege of sharing the art with the men.

In the 'Harmonia Gynæcorium,' there are extant several directions and recipes on the subject of Midwifery, collected from the writings of one Cleopatra, interspersed with those of Mosehion and Priscian; and some people imagine this was no other than the famous Cleopatra, Queen of Egypt, because in the preface Arsinoe is mentioned as the

author's sister. Galen, who lived two hundred years after this Egyptian queen, advises the reader to consult the writings of one of that name, but does not inform us whether she was or was not that celebrated princess; so that in all probability it was some other person of the same name, as the study and exercise of such an art was not at all suited to the disposition of such a gay voluptuary as Queen Cleopatra is described to have been.

Aetius transcribes some chapters from the works of one Alpasia, touching the method of delivering and managing women in natural labours; but gives no account of the place of her residence, nor of the time in which she wrote. Several other female practitioners are mentioned by different historians; but as none of their writings are extant, and the accounts given of them are mostly fabulous and foreign to our purpose, I shall forbear to mention them in this place; and referring the curious to Le Clerc's 'History of Physic,' begin with Hippocrates, the most ancient writer now extant upon the subject, who may be styled the father of Midwifery as well as medicine; because all the succeeding authors, as far down as the latter end of the sixteenth century, have copied from his works the most material things relating to the diseases of women and children, as well as to the obstetric art. I shall therefore give a succinct account of his practice; and in my detail of the other authors, only observe the improvements they have made, and the circumstances in which they have deviated from his method and opinion.

Hippocrates, who practised medicine in Greece about 460 years before the Christian æra, no doubt availed himself of the observations of those who went before him in the exercise of the same profession. He acquired the highest reputation by his wise predictions and successful practice, and by his uncommon sagacity and experience, greatly improved the healing art.

In his book 'De Natura Muliebri,' and those 'De Mulierum Morbis,' he mentions and describes many diseases peculiar to the female sex, according to the theory of those times; and prescribes more medicines for the diseases of women than for any other distempers.

Many of his remedies, indeed, are very strange and uncouth; but a number of them are still accounted excellent in the present practice, unless his names of them have been mistaken, and misapplied to other medicines: and although his theory is frequently odd and erroneous, his diagnostics, prognostics, and method of cure, are often just and judicious.

In suppressions of the menses, he first of all orders vomits and purges, then sharp pessaries in form of suppositories, composed of lint or wool, with divers kinds of deobstruent powders, wax and oil, to be introduced into the vagina: he likewise prescribes fumigations, fomentations, and hot baths, together with internal medicines. He observes, that such obstructions produce a pain and seeming weight in the lower part of the abdomen, extending to the loins and ilia, attended with a vomiting at intervals, like those of a pregnant woman. If these symptoms of pain and weight affect the hypochondria, producing suffocation and pain in the head and neck, the patient is to be relieved by the application of fetid things to the nose, with castor and fleabane given internally in wine, &c.

When the menses flow in too great a quantity, he proposes a contrary method: he advises her to abstain from bathing and all laxative and diuretic things; orders astringent pessaries for the vagina, and cold applications to the lower parts; prescribes internally several kinds of astringent medicines, with the peplium or poppy-seed, and cupping-glasses to be applied to the breasts. When the violence of this discharge is abated, he proposes purges

and vomits, then asses' milk and a nourishing diet, and various kinds of internal and external medicines.

In a fluor albus, he says the urine is like that of an ass; the patient labours under a pain in the lower part of the abdomen, loins, and ilia, together with a swelling in the hands and legs; her eyes water, her complexion becomes wan and yellow, and in walking she is oppressed with a difficulty of breathing; in this case he prescribes emetics and cathartics, asses' milk, whey, fomentations, and different kinds of medicines, to deterge and strengthen the parts affected.

He mentions many complaints which, in his opinion, proceed from different motions and situations of the uterus, and proposes a good many medicines for the cure. As to his theory of conception, and his opinions about the birth in the seventh or eighth month of gestation, they were actually espoused by all medical writers till the last century.

In his first book of the diseases of women, he treats of difficult labours; observing, that if a woman is at her full time seized with labour-pains, and cannot after a long time be delivered, the child either lies across, or presents with the feet; for when the head presents the case is favourable: whereas if the child lies across, a difficult labour ensues. This assertion he illustrates by the example of an olive in a narrow-mouthed jar, which cannot be so easily extracted by the middle as when it presents with one end. He likewise says, that the birth will be difficult when the feet presents; in which case either the mother or child, or both (for the most part) perish: nor is the birth without difficulty when the fœtus is dead, apoplectic, or double. He then proceeds to direct us how to relieve the woman of several complaints to which she may be subject after delivery: he describes the method of excluding the fœtus, and of assisting in difficult labours; if the child presents fair, and is not

easily delivered, he orders sternutatories to be administered, and the patient to stop her mouth and nose, that they may operate the more effectually: she must also be shaken in this manner; let her be fastened to the bed by a broad band crossing her breast, her legs being bended to the lower part of the bed, the other end of which must be elevated by two assistants, who gently shake her by intervals, until her pains expel the child: the parts must be anointed with some unctuous medicine, and cautiously separated; and care must be taken that the placenta immediately follow the child. If the fœtus lie across, presenting to the os uteri, whether it be alive or dead, he orders it to be pushed back and turned, so as that it may present with the head in the natural position; and in order to effect this purpose, the woman must be laid supine on a bed, with her hips raised higher than her head. If the child is alive, and presents with the arm or leg, he advises us to return them as soon as possible, and bring down the head, or if it lie across, presenting with the side or hip, the same methods must be used; then the woman may be refreshed by sitting over the steams of hot water. The child is to be managed in the same manner when it is dead, and presents with leg or arm, or both; but if the fœtus cannot be conveniently delivered on account of the body's being swollen, he directs us to bring it away piece-meal, in the following manner:—If the head presents, let it be opened with a small knife, and the bones of the skull being broken, must be extracted with a pair of forceps, for fear of hurting the woman; or by an embryulcus, firmly fixed on the clavicles, it may be extracted by little and little. After the head is delivered in this manner, should the child stick at the shoulders, he directs us to divide the arms at the articulations; and they being brought away, the rest of the body generally follows with ease: but if it will not yet give way, the whole breast must be divided, and great care taken that no part of the intes-

tines be denudated or wounded, lest the guts, or their contents, falling out, should retard the operation; then the ribs being broken, and the scapulæ extracted, the rest of the fœtus will easily follow, unless the abdomen is swollen; in which case the belly must be punctured, and on the exit of the flatus, the child will be brought along. If part of the child is already delivered, and the rest will not follow, nor can that which is out be returned, he orders the operator to take away as much as he can of it, and pushing up the remainder, turn the head downwards: but, previous to this operation, he advises him to pare his nails, and to use a crooked knife, the point and back of which must be covered with the fore-finger at its introduction, lest it should hurt the uterus.

In his book 'De Superfœtatione,' he directs us, when the child's head appears without the os uteri, and the rest of the body does not follow, the fœtus being dead, to wet our fingers with water, and introducing them between the os uteri and head, put one into the mouth, and laying hold of it bring it along. When the body is delivered, and the head remains behind (in those cases when the child comes by the feet), he advises the operator to dip both his hands in water, and introducing them between the os uteri and head of the child, grasp this last with the fingers, and extract it. If the head is in the vagina, it may be delivered in the same manner. When the child remains dead in the uterus, and cannot be delivered either by the force of nature or medicines, he directs us to introduce the head, anointed with some unctuous cerate; and dividing the parts with an unguis fixed on the great finger, bring the fœtus along, as before.

In the first book of the 'Diseases of Women,' he gives directions for excluding the secundines, provided they are not expelled in the natural way. He says, if the secundines come not away immediately after the birth, the woman

labours under a pain in her belly and side, attended with rigors and a fever, which vanish when they are discharged; though for the most part the after-birth putrefies and comes away about the sixth or seventh day, and sometimes later. In this case, he orders the patient to hold her breath; and prescribes internally mugwort, Cretan dittany, flowers of white violets, leaves of agnus castus, with garlic boiled or roasted, small onions, castor, spikenard, rue, and black wine.

In the book 'De Superfœtatione,' after having described the methods of delivering a dead child, he says, if the secundines come not away easily, the child must be left hanging to them, and the woman seated on a high stool, that the fœtus by its weight may pull them along; and lest this should be too suddenly effected, the child may be laid on wool newly plucked, or on two bladders filled with water, and covered with wool, which being pricked, as the water evacuates they will subside, and the child sinking gradually, will gently draw the secundines away; but should the navel-string happen to be broken, proper weights must be tied to it, in order to answer the same purpose; these being the easiest and least hurtful methods of extracting the placenta.

He afterwards observes, that if the woman has had a difficult labour, and could not be delivered without the help of machines, the child is generally weak, and therefore the navel-string ought not to be divided until it shall have either urined, sneezed, or cried aloud; in the meantime, it must be kept very near the mother: for though the child does not seem to breathe at first, nor to give any other signs of life, the navel-string, by remaining uncut, may be in a little time inflated, and the life of the infant saved.

With regard to the lochia or menses after delivery, he takes notice, that if they are altogether suppressed, or the discharge insufficient, and the uterus is indurated, the patient is afflicted with pains in the loins, groins, sides,

thighs, and feet, together with an acute fever, accompanied with horrors. When the pains happen unattended with a fever, he orders bathing, and the head to be anointed with oil of dill; and a decoction of mallows, with oil of Cyprus, to be applied externally, in order to assuage the pain. He says, in all disorders where fomentations are necessary, the parts ought afterwards to be anointed with oil: but when there is a fever in the case, bathing must be avoided, warm fomentations used, the uterine medicines prescribed in draughts, and garlic, castor, or rue boiled with oatmeal: he likewise observes, that if the uterus is inflamed after delivery, the patient is in imminent danger of her life unless a stool can be procured, or the symptom removed by bleeding. He likewise ascribes several complaints and disorders of women to the different positions and motions of the uterus; of which last, Plato, who lived immediately after Hippocrates, gives a very odd and romantic description in his Timæus. After affirming that there is implanted in the genitals of man an imperious, headstrong, inobedient power, that endeavours to subject everything to its furious lusts; he says, the vulva and matrix of women is also an animal ravenous after generation, which being baulked of its desire for any length of time, is so enraged at the disappointment and delay, that it wanders up and down through the body, obstructing the circulation, stopping the breath, producing suffocations, and all manner of diseases.

Although we have a piece in English called 'Aristotle's Midwifery,' I find little or nothing of the practice in his works; he hath written on the generation of animals; and we find in him several hints curious enough, even upon our subject: he tells us, that women suffer more than other animals from gestation and labour; that those women who take most exercise, endure both with the greatest ease and safety; and that the fœtus in all animals naturally comes

by the head, because there being more matter above than below the navel, the head necessarily tilts downwards. For this reason, he says, every birth in which the head presents is natural, and those unnatural in which the feet or any other part of the body come foremost.

We have nothing written on the subject of midwifery from his time to that of Celsus, who is supposed to have lived in the reign of the emperor Tiberius. This author hath given us a chapter on the delivery of dead children and the placenta, in which he hath copied from Hippocrates; though he is more full than his master, and mentions several improvements on his practice. After having given directions with regard to the woman's position, he advises the operator to introduce one finger after another, until the whole hand shall gain admittance; he says, that the largeness of the uterus, and the strength and courage of the patient, are great advantages to the birth; that the woman's abdomen and extremities must be kept as warm as possible; that we must not wait until an inflammation is produced, but assist her without delay; because, should her body be swelled, we can neither introduce our hands, nor deliver the child, without great difficulty; and vomitings, tremors, and convulsions, often ensue. When the crotchet is fixed upon the head, he directs us to pull with caution, lest the instrument should give way, and lacerate the mouth of the womb; by which means the woman would be thrown into convulsions, and imminent danger of her life. When the feet present, he says, the child is easily delivered, by laying hold on them with the hands, and so bringing them along. If the fœtus lie across, and cannot be brought down, he orders the crotchet to be fixed on the arm-pit, and drawn along by little and little; by these endeavours the neck will be almost doubled, and the head bent backwards; in which case this last must be separated from the body, and the whole extracted piece-

meal. The operation, he says, must be performed with a crotchet, the internal surface of which is edged, and the head be brought away before the body; because, if the greatest part be extracted first, and the head left alone in the uterus, the case will be attended with great difficulty and danger. Nevertheless, should this misfortune happen, he directs a double cloth to be laid on the woman's belly, and a skilful assistant to stand at her left-side, and with both hands on the abdomen to press from side to side, with a view of forcing the head against the os uteri; which being effected, it must be delivered by fixing the crotchet in the skull. With regard to the placenta, he directs us to deliver it in this manner: The child being delivered, must be given to a servant, who holds it on the palms of his hands, while the operator gently pulls the umbilical cord for fear of breaking it, and tracing it with his right-hand as far as the secundines, separates the placenta from the uterus with his fingers, and extracts it entire, together with the grumous blood: then the woman's thighs being placed close together, she must be kept in a moderately warm room, free from wind, and a cloth dipped in oxyrrhodon must be laid on her abdomen: the rest of the cure consisting in the application of those things which are used in inflammations and wounds of the tendons.

Mosehion, who is supposed to have lived at Rome in the reign of Nero, says, that in difficult births the parts are first of all to be relaxed with oil: if the passage of the urine is obstructed by a stone in the neck of the bladder, he advises us to draw off the water with a catheter; if the fæces are indurated, he prescribes a glyster, and orders the membranes to be pierced with a lancet. He says the best position is that of the head presenting, the hands and feet being mingled and disposed along the sides. If the position is not right, and cannot be amended by putting the woman in proper postures, he advises us to introduce the

hand when the os uteri is opened, and turn the child. If a foot presents (says he) push it back, and bring the fœtus by both feet, the arms being pressed down along the sides: if the knee or hip presents, they must be also pushed back and the child brought by the feet: if the back presents, introduce the hand, and alter the position by turning to the feet or to the head, if it be nearest; and if the head is large it must be opened, &c.

Rufus Ephesus, who lived in the reign of Trajan, gives a short account of the uterus and its appendages, and describes those tubes which are now called Fallopian, as opening into the cavity of the womb; though Galen arrogates this discovery to himself so particularly, as to say upon this subject, that he was surprised to find they had escaped the notice of the common herd of anatomists; but more especially amazed that a man of Herophilus's accuracy should be ignorant of them: and Rufus has expressly mentioned the opinion of Herophilus on this particular.

Galen was born in the time of the emperor Adrian, anno Dom. 131, about six hundred years after Hippocrates; upon whose works he writes commentaries, and gives some reasonable aphorisms relating to women and children: we have two books of his writing, 'De Semine' (the third being accounted spurious); one 'De Uteri Dissectione, de Fœtuum Formatione, de Septimestri Partu,' lib. 14, & 15 'De Usu Partium.' He hath also written several books on anatomy and physiology, but nothing de morbis mulierum. In his physiology he is prolix and inaccurate: his anatomy is pretty exact in many things; but upon the whole, he contains little or nothing to our purpose.

In Oribasius, who was a physician to Julian, we have a description of the parts, and in several places of his works, an account of the medicines used by the ancients in the diseases of women and children: he has also a chapter on

the choice of a nurse, and another upon the milk, but says nothing of the operation.

Actius, who (according to Le Clerc) lived in the end of the fourth, but in the opinion of Dr. Friend, in the end of the fifth century, was likewise a collector from the ancients: for neither he nor Oribasius can be styled original writers; the last indeed copied from none (almost) but Galen, and was therefore styled Simia Galeni; whereas the other compiled from all the authors that went before him, many of whom would have been lost in oblivion, had they not been mentioned in his works. He is very particular upon the diseases and management of women; his fourth Sermo of the fourth Tetrad being expressly written on this subject, and containing almost everything which has been said before him.

In his first chapter, 'De Uteri Situ, Magnitudine, ac Forma,' he distinctly divides the womb into a fundus and neck, and describes the os tincæ as ending in the Sinus Muliebris, sive Pudendum; which plainly appears to be no other than what we now call the vagina; for he says it is above six inches in length; but his description of the figure of the uterus is imperfect. His seventh chapter treats of conception, from Soranus. The tenth of the pica, taken from some of Galen's works that are lost. His description of this disease is to the following purpose:—Young women with child have vitiated appetites, and long for earth, ashes, coal, shells, &c. The distemper continues till the second or third month of gestation, but commonly abates in the fourth. To remedy the nausea and vomiting that attend it, he orders aloes, dried mint, and other stomachics.

In his twelfth and fifteenth chapters he gives a detail of Aspasia's practice in the care and management of women during pregnancy, and in time of labour; but the greatest part of these and the other chapters are taken from Hippocrates, to whom he has made a few insignificant additions,

until we come to the twenty-second, in which there is a very full and distinct account of difficult births.

Among the causes that produce difficult labours, he enumerates weakness of mind or body, or both, a confined uterus, a narrow passage, natural smallness of the parts, obliquity of the neck of the uterus, a fleshy substance adhering to the cervix or mouth of the womb, inflammation, abscess or induration of the parts, rigidity of the membranes, premature discharge of the waters, which ought to be detained for moistening and lubricating the parts, a stone pressing against the neck of the bladder, and extraordinary fatness; an anchylosis of the ossa pubis at their juncture, by which they are hindered from separating in time of parturition; too great pressure of the uterus on the cavity of the loins, or too great quantity of fæces and urine retained in the rectum and bladder; an enfeebled constitution, advanced age, slender make, and greenness of years, attended with weakness and inexperience.

He observes, that difficult labours likewise proceed from circumstances belonging to the child that is to be born; from the extraordinary size of the body, or any part of it; from its being unable (through weakness) to facilitate the birth by its leaping and motion; from the crowding of two or three fœtuses; from twins presenting together at the mouth of the womb; from the death of the child, as it can give no assistance in promoting labour; from its tumefaction after death, and wrong presentation.

He says the natural position is when the head presents and comes forward, the hands being extended along the thighs; and the preternatural, that in which the head is turned either to the right or left side of the uterus; when one or both hands present, and the legs within are separated from one another: that the danger is not great when the feet present, especially if the child comes forwards with the hands along the thighs; and that if while one leg presents,

the other is kept up or bent in the vagina, this last must be brought down: nor is the difficulty great in those that lie across, a circumstance that may happen in three different ways; namely, when the child presents with either side, or with the belly: nevertheless he observes, that the case is easiest when the side presents, because there is more room for the operator to introduce his hand and turn the fœtus, so as that it may come either by the head or feet. The worst position, he says, is when the child presents double, especially if the hip-bones come foremost: this double presentation happens with the hips, the head and legs, and the belly; in which last case he observes, that if the abdomen is opened, and the entrails taken out, the parts collapse, and the position is easily altered.

Over and above the fore-mentioned causes of difficult labour, he affirms it may be owing to an over-thickness or thinness of the membranes which break too late or too soon; as also to external causes, such as cold weather, by which the pores and passages of the body are constringed; or very hot weather, by which they are too much relaxed. All these circumstances, he says, ought to be minutely inquired into, and duly considered, by the physician who directs the midwife; nor ought this last to be permitted to tear or stretch the parts with violence. If the difficulty proceeds from the form of the pelvis, he directs the woman to be seated on a stool, her knees being bent and kept asunder; by which means the vulva will be dilated, and the cervix extended in a straight line: and those that are gross or fat are to be placed in the same manner. If the difficulty arises from straitness, stupor, or contractions, he says it will be proper to relax the parts, by seating the patient over warm steams and fumigations in a place conveniently warmed; by pouring into the vagina warmed oils, and by the application of emollient ointments and cataplasms: for this purpose he likewise recommends the warm bath, unless a fever or other

complaint render it improper. Some, he observes, are carried about in a litter in a warm place; and others have been subjected to violent concussions: but those who, by a weak loose habit, are too much enfeebled to undergo labour, ought to be treated with prescriptions that consolidate, strengthen, and constringe: they ought to be sprinkled with perfumes and vinegar, anointed with cooling ointments of wine and oil of roses, and sit over infusions of roses, myrtle, pomegranates, and vine-twigs. If the difficulty is owing to the preternatural position of the fœtus, it must be as much as possible reduced into the natural way. If the foot or hand is protruded, the child must not be pulled by either; the limb must be returned, twisted, or lopped off, and the shoulder or hip moved with the fingers into a more convenient situation. When the whole body of the fœtus is strongly pressed down in a wrong position, he advises us to raise it to the uppermost part of the uterus, and turn it downwards again in a right posture: this operation must be performed gently and slowly, without violence; oil being frequently injected into the parts that no injury may be sustained by either mother or child. If the mouth of the womb continues close shut, it must be softened and relaxed with oily medicines: if there is a stone in the neck of the bladder, it must be pushed up with the catheter, and the urine (if in great quantity) drawn off. If the rectum is filled with fæces, it must be evacuated by glysters: and proper methods are to be taken when delivery is prevented by inflammation, abscess, ulcer, soft or hard tumours, or or any other such obstacles.

If the difficulty proceeds from a fleshy substance adhering to the neck of the womb, or from a thick membrane found in those women who are imperforated, the obstacle in both cases must be removed by the knife; and if the membranes that surround the child are too rigid to give way at the proper time, they must be cut without delay: if,

on the contrary, the waters are discharged too soon, so as that the parts are left dry, the want of them must be supplied with lubricating injections made with the whites of eggs, decoctions of mallows, fenugrec, and the cream of barley ptisan.

If the difficulty proceeds from the smallness or strong contraction of the uterus, the parts are likewise to be rendered soft and distensible with lubricating ointments and fomentations; the mouth of the womb must be dilated with the fingers, and the child extracted by force; but should this method fail, the fœtus must be cut in pieces, and brought away by little and little. This, he says, is the only resource when the fœtus is too large, and the most proper when it is dead; and its death may be certainly pronounced when the presenting part is felt cold and without motion. When two, or three, children present in the neck of the uterus, those that are highest must be raised up to the fundus until the lowest be first delivered.

If the difficulty is owing to the excessive largeness of the head, breast, or belly, he says it will be absolutely necessary to open these cavities; and observes, that the most proper time for placing the woman in labour upon the stool, is when the membranes are felt presenting in a round extended bag.

His twenty-third chapter contains the method of extraction and exsection of the fœtus from Philumenus; and is an accurate detail of the operations recommended above. He says before the operator begins to deliver by exsection he ought to consider the strength of the patient, and determine with himself whether or not there is a probability of saving her life; because, if she is exhausted, enervated, lethargic, seized with convulsions, *subsultus tendinum*, with a disordered pulse, it is better to decline the operation than run the risk of her perishing under his hands: but if he thinks her strength sufficient for the occasion, let her be

laid in bed on her back, her head being low, and her legs being low, and her legs held asunder by strong experienced women; she may take by way of cordial, two or three mouthfuls of bread dipped in wine, in order to prevent her fainting; for which purpose, her face may be also sprinkled with wine during the operation. The chirurgeon having opened the pudenda with an instrument, and observed the source of the difficulty, whether tumour, callus, or any of the causes already mentioned, he must take hold of it with a forceps, and amputate with a bistory: if a membrane obstructs the mouth of the womb, it must be divided: if the delivery is prevented by the rigidity of the membranes that invelope the fœtus, they must be pinced up with a pair of small forceps, and cut with a sharp knife; then the perforation may be dilated with the fingers, so as to effect a sufficient opening for the passage of the child.

If the passage is obstructed by the head of the fœtus, it must be turned and delivered by the feet; but if the head is so impacted as that it cannot possibly be returned, a hook or crotchet must be fixed in the eye, mouth, or over the chin, and in this manner the child may be extracted with the operator's right hand; but besides this crotchet, which ought to be gently introduced, and guarded with the fingers of the left hand, another must be insinuated in the same manner, and fixed on the opposite side, that the head may be extracted more equally, without sticking in one place, and one of the instruments hold in case the other should slip; and when these crotchets are properly applied, the operator must pull, not only in a straight line, but also from side to side.

He directs us to introduce our fingers besmeared with unctuous medicines, betwixt the mouth of the womb and the impacted body, in order to lubricate it all round. When the fœtus is delivered as far as the middle, the extracting instrument must be fixed in the upper parts: if the head

is either naturally too large or dropsical, it must be opened with a sharp-pointed knife, that it may be evacuated, contracted, and delivered: but if, notwithstanding this operation, it cannot be brought along, the skull must be squeezed together, the bones pulled out with the fingers or bone-forceps, and the crotchet fixed for delivery. If after the head is extracted, there should be a contraction round the thorax, a perforation must be made near the clavieles in the cavity of the breast, that the bulk may be diminished by the evacuation of the contained humours: if the child is dead, and the belly distended with air or water, the abdomen must also be opened, and, if need be, the intestines extracted.

If the arm presents, it must be separated at the joint of the shoulder: for this purpose a cloth must be wrapped round it, that it may not slip while it is pulled down to the shoulder; then opening the labia, the joint will appear at which the limb may be taken off: this amputation being performed, the head must be pushed up, and the fœtus delivered. The same method must be pursued when both arms present, and when, though the feet are forced out, the rest of the body will not follow; in which case the legs must be separated at the groins.

If, when the fœtus presents double and cannot be raised up, the head is farthest down, the bones of the skull are to be squeezed together without opening the scalp or skin, and the crotchet being fixed in some part of it, will bring it forth, the body following in a straight line: but if the the legs are nearest, they must be amputated at the coxa, and the hips pushed up, so as to allow the head to be squeezed and prepared for extraction. When the fœtus presents double, he says it is better to divide the head from the body than to push up the thorax and deliver by the feet: but should the rest of the body be delivered and the head left behind, the left hand, anointed, must be intro-

duced into the uterus, and the head being brought down with the fingers to the mouth of the womb, one or two crotchets must be fixed on it, in order to bring it along; the most proper places in the head for the application of this instrument being the eyes, ears, mouth, or under the chin. For the extraction of the thorax, it may be fixed in the arm-pits, clavicles, præcordia, breast, and joints of the back and neck: for the lower parts, on the pubis, or in the pudenda of female children.

If the mouth of the womb be shut by an inflammation, he cautions us against using any violence; but orders it to be softened and relaxed by oily medicines, fumigations, baths, cataplasms; by these means the inflammation will be lessened or removed, and the os internum dilated so as to allow the fœtus to be delivered. If the body hath been extracted piecemeal, he directs the parts to be laid together, in order to observe if the whole is delivered; and if any thing remains, it must be extracted without delay.

In his twenty-fourth chapter (the substance of which is also taken from Philumenus), he lays down the following directions for extracting the secundines.

The os internum (when the secundines are detained) is sometimes shut, sometimes open, and often inflamed; the placenta sometimes adhering to the fundus, and sometimes in a state of separation. If the os internum is open, and the secundines, separated from the uterus, lie rolled up like a ball, they are easily extracted by introducing the left hand warmed and anointed; and after having taken hold of them, drawing them gently down from side to side, and not straightforwards, for fear of a prolapsus vulvæ. If the os uteri is shut, it must be opened slowly with the finger, after it hath been lubricated with oil, or auxunge: if this method should fail, a poultice of barley-meal malaxed with oil, must be applied to the belly, the oily injections repeated; and if the patient's strength will permit, she must

take sternutatories of castor and pepper, and potions of those medicines that bring down the menses, sitting at the same time over a fumigation.

All these things must be tried on the first and second days; and if they succeed so as to open the mouth of the womb, the secundines will be easily extracted as above: but if all these methods fail, the woman must be no longer fatigued; they will in a few days putrefy and come off in a dissolved sanies; and should the fetid smell affect the head and stomach, he prescribes such medicines as are used in obstructions of the menses.

His next chapter, which is taken from Aspasia, treats of the management of women after delivery; and he writes several more on the diseases incident to women, such as inflammations, imposthumes, and cancers of the breast and uterus; compiled from Philumenus, Leonides, Archigenes, Philagrius, Soranus, Rufus, Aspasia, and Asclepiades.

The next considerable author on this subject is Paulus Aegineta, whom Le Clerc supposed to have lived in the latter end of the fourth century; though Dr. Friend brings him down to the seventh: he was the last of the old Greek medical writers.

His method of practice is much the same with that of Aetius and Philumenus, as above described; and though not so full as they, he is very distinct and particular. He tells us in his preface, that he had collected from others; and although he was the first who had the name of *man-midwife* from the Arabians, the writings of Aetius plainly show that there had been many male-practitioners before him. In the seventy-sixth chapter of his third book, which treats of difficult births, he gives the appellation of *natural* to all those in which the head or feet present; and all other positions he deems preternatural.

In another place, he observes, that the woman ought to be seated on the stool or chair, when by the touch the

mouth of the womb is felt open, and the membranes pushed down. As to his method of extraeting a dead ehild and the plaeenta, it is mueh the same with that already deseribed from Philumenus, in the preeeding artiele.

Paulus is supposed to have studied at Alexandria; for long before his time the Roman empire in the west had been over-run and ruined by the Goths and Vandals. Soon after this period, learning began to dceline in the east: thc sehools of Alexandria were removed to Antioeh and Haran by the Saraeens, who subdued Egypt, and destroyed the Roman empire in Asia: and then the Greek physieians were translated into the Syriac and Arabie, at least the Arabians eopied from them. This subjeet is fully discussed by Dr. Friend, in his History of Physie.

Serapion, one of the first Arabian writers, in his Tractatus Quintus, has several chapters on the diseases of pregnant women, with the method of cure.

The next author of any note belonging to this country was Rhazes; who in the latter end of the ninth eentury lived at Bagdat. Like other systematie writers in physic, he hath treated of the diseases of women; and written one book expressly on the diseases of children.

In the last ehapter of his 'Liber Divisionum,' he orders the membranes when they are too tough, to be pierced with the nail of the finger, or with a little knife; and if the waters are discharged a long time before delivery, so that the parts remain dry, he direets us to anoint them with oily eerates.

Avieenna lived at Ispahan about the year 1000; and was so famous for his writings all over Asia and Europe, that no other doetrine was taught in the schools of physic till the restoration of learning. He is a voluminous author, treats largely of every part of midwifery, so far as it was known in his time; copying from thosc that went before

him: the operation for the dead child he takes from Paulus; the extraction of the secundines from Philumenus; and the use of the fillet from his countryman Rhazes. He is very full on all the diseases of women relating to the menses, uterine gestation, and delivery.

In all preternatural cases he says, the head ought to be reduced into the natural position: but should this be found impracticable, he advises us to deliver by the feet. He alleges that the head is the only natural way of presenting, and that all other positions are preternatural; though of these the easiest is when the fœtus presents with the feet.

He recommends all the old methods for assisting in natural labours; and if the woman cannot be delivered by these, he orders a fillet to be fixed over the head: if that cannot be done, to extract with the forceps; and should these fail, to open the skull; by which means the contents will be evacuated, the head diminished, and the fœtus easily delivered.

The next Arabian medical writer is Albucasis, who, in the eleventh or twelfth century, lived at Cyropolis, a city of Media on the Caspian sea; and it appears from an Arabian manuscript in the Bodleian library, that this is the same person who was also known by the name of Alsabaravius.

He hath written on natural labours in the same way with his predecessors, advising us to assist the birth with fomentations and ointments, and by reducing the child into the natural position when any other part than the head presents. His operation for extracting the dead child is literally the same with that described by Aetius; but whether he copied it from that author, or from other Arabians his predecessors, is uncertain.

What is most particular in this author is, the description and figures of the instruments then used in midwifery: namely, a vertigo for opening the matrix, which seems to be much of the same contrivance with that which Rhazes calls

the torculum volvens. He likewise exhibits the figures of two other instruments for the same purpose; but not one of the three in the least resembles the speculum matricis, described in later writers: an impellens, to keep up the body of the child while the operator endeavours to reduce the head into the natural position: two kinds of forceps, the larger he calls almisdach, the other misdach; and two different kinds of crotchets. The almisdach is of a circular form, and seems contrived to deliver the head in laborious cases; the misdach is straight and full of teeth, according to the manuscript in the Bodleian library at Oxford; but in the Latin edition, both are circular and full of teeth.

After the twelfth century, physic began to decline in Asia. Theodore Gaza brought the Greek manuscripts from Constantinople, after that city was taken in the year 1453; and about this time the art of printing being found out, all the knowledge of the ancients was soon dispersed over Europe.

In the next century the practice of physic began to be encouraged in England. Linacre, born at Canterbury, and chosen fellow of All Souls in Oxford in the year 1484, was a man of learning, and projected the foundation of the collegeof physicians in London; for which he obtained a patent from king Henry VIII, and was himself president of it till the day of his death.

[A notice of Eucharius Rhodion, (the same mentioned in Smellie's footnote on next succeeding page,) may very fitly come in here. His work, 'De Partu Hominis,' was for a long time the text-book of highest repute and authority throughout Europe. The first edition was published in high Dutch, about the year 1519. In 1532 a Latin edition appeared, and subsequently it was translated into German, French, and English. A copy of the Latin edition fell into my possession (and is now in the library of the King and Queen's College of Physicians, Dublin), dated Frankfort, 1563. It is a small duodecimo, illustrated with some very rudely-executed woodcuts, of the anatomy of the female generative organs, the posi-

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tions of the fœtus in utero, of a lying-in chair or stool, and of a bicephalous monster, like to the famous Ritta Christina. It is provided with a table of contents and a very good alphabetical index. It contains little more than is to be found in the writings of preceding authors, especially Hippocrates, Aetius, Moschion, and Paulus Aeginetus. The style of this work is remarkable for brevity and perspicuity, combined with which is methodical arrangement. It really contains nothing original, and nothing to indicate that its author—who was a surgeon at Frankfort—was even a man of any experience. The work next noticed by Smellie—that, namely, of Dr. Raynalde—was in reality only a free translation of Rhodion's book, 'De Partu Hominis.']

In the year 1565, one Dr. Raynalde published a book on Midwifery, which he had translated into English from the original Latin. He informs the reader in his prologue (as he terms it), that the book, which was called 'De Partu Hominis,' had been translated about two or three years before, at the request of some women, by a studious and diligent clerk; who having performed the task incorrectly, he (Dr. Raynalde) had been at great pains to revise and enlarge it in another translation: he also observes, that the Latin edition had been formerly published in Dutch, French, Spanish, and other languages.*

The author of this performance (contrary to the opinions of other writers) says, when the child presents in the natural way with the head, that the face and fore-parts of the fœtus are towards the fore-parts of the mother; and that if any other part presents, the position is preternatural. He observes, that in France and Germany the woman is commonly placed in a sitting position, on a stool made in form of a compass; and advises us, in all preternatural

* This author was Eucharius Rhodion, whose book was in great esteem all over Germany; and in the year 1532 being translated into Latin, and other languages, from the original High Dutch, became universally the woman's-book over all Europe, and was introduced into England; where it was translated by this Dr. Raynalde, who nevertheless has taken great liberties with the author.

cases, to turn the child to the natural position, even when the feet present; but if this should be impracticable, to bring it footling, and in extracting to bind the feet together with a linen cloth. This, however, he pronounces a very jeopardous labour. He directs us to provoke and promote the delivery with fumigations and pessaries, and to prescribe internally; assafœtida, myrrh, castor, and storax: From which circumstances, he seems to have copied from the ancient writers.

[As this was the earliest treatise upon midwifery in the English language, and had a longer run of popularity than any similar work has since had, or is ever likely to have, it well deserves a more extended notice than our author has given of it. The title ran thus: 'The Birth of Mankinde; otherwise named, The Woman's Booke. Set forth in English by *Thomas Raynalde*, Physitian, and by him corrected and augmented. London, 1606.' (The o here has somewhat the appearance of having been surreptitiously altered with a pen, and may have been printed 2.) My friend, Professor Sinclair, has shown me another copy of this work, printed in the year 1565, and from the wording of the preface there would seem to have been an earlier edition than this, so far corroborating Velpeau's assertion that it was first printed in 1540, whereas Smellie assigns a much later date. Both these copies are small quarto size. It went through many editions subsequently, and, according to Denman, it was the popular treatise on midwifery in England for close on a hundred years, that is till near 1634, when the works of Ambrose Paré were translated. I have carefully compared the two editions already mentioned—both of which are in black letter—and though the interval between them is very considerable (certainly beyond forty years) they do not differ from one another in any particular, except occasionally in the form of the type. The illustrations are exactly similar to those in Rhodion's treatise, to which I have before alluded. No mention is made of manual extraction of the placenta, but the dangerous effects arising from its prolonged retention are noticed. Post-partum hæmorrhage, "the outragious fluxe of flowers," as Raynalde calls it, is described, and many remedies "to cease and restraine this overmuch flowing of flowers" are pointed out, viz., "electuaries, confections, troschistres, powders, glysters, odours,

suffumigations, baths, plaisters, and oyntments, of which for the love of women I will heere set foorth the most principall and best." There is no mention of eold or of pressure in this long eatalogue, but we are told, "who that requireth further in this matter, let them aske eounsell of the physitians." Laeeration of the perineum as a eonsequenee of labour is mentioned, and two ways of stiteking it are deseribed. In one of these the suture does not pass through the flesh at all, but through a pieee of strongly adhesive plaister which is attaehed to the perineum on each side of the "rift." In every part of this treatise we meet with errors and absurdities, and hardly any single eireumstanee eonneeted with parturition is eorrectly deseribed. We seareh its pages in vain for any evidenee of the aeeurate observation of nature. He states that the birth of a male ehild is easier than that of a female, and that a seven months' child is more likely to survive than one born at eight months. The absurd notion of the aneients that the act of parturition depends mainly on the exertions and efforts of the ehild itself, pervades the whole work. The drawings and deseriptions of the positions of the fœtus in utero are all erroneous and faneiful. The simplest truths of nature are everywhere overlookcd, and the praetiee of the art is barbarous and superstitious in the extreme. Along with all this the number and variety of remedies preseribed, and the eonfidenee with which they are recommended, is most remarkable, and the eonviction is foreed upon us that a multitude of remedies only bespeaks the real impoteney of our resourees! With a view to alter the position or presentation of the ehild, after the aeeession of labour, we are taught to subjeet the unfortunate patient to various bodily movements, and to plaee her in different attitudes that must have been most irksome to her, and utterly inadequate to promote the objeet in view.

Whilst giving direetions how the midwife is to extraet the dead fœtus, in a diffieult labour, by means of embryotomy and hooks, allusion is also frequently made to the assistanee she may derive from the art of the "Chirurgian," and his "meete instruments made for the nonee." Cæsarian seetion is advised if the woman should die in labour, the ehild being alive; "then shall it be meete to keep open the woman's mouth and also the neather plaees, so that the child may by that means both reeeive and also expel ayre and breath, which otherwise might be stopped to the destruetion of the ehild. And then to turn her on the left side and there to eut her open and

to take out the child." This is the only mention of the greatest of obstetric operations.

The book has a table of contents, but no alphabetical index.]

Several authors of note lived and wrote in the sixteenth century, or betwixt the years 1530 and 1590, upon the diseases of pregnant women and the different methods of delivery. A collection of the most remarkable among these writers, who are called the old moderns, was published at Basil, 1586, in 4to, intitled, 'Gynæciorum Commentaria;' and afterwards, in 1597, republished at Strasburg in folio, by Israel Spachius, professor of medicine in that city, with the addition of two authors who had not been mentioned in the first. At the head of this collection is Felix Plateras, born at Basil: He published tables, explaining the use and structure of the parts of generation proper to women.

The next is the 'Harmonia Gynæciorum,' collected from Cleopatra, Moschion, Theodorus Priscianus, and another uncertain author, freed from repetitions and superfluities by Casparus Vulphius.

Then follows 'Eros,' first published among the old Latin writers at Venice, by the sons of Aldus.

The fourth place is held by Nicolaus Rocheus, a Frenchman, whose works, published at Paris, are taken from the Greeks and Arabians; though he hath added some observations of his own. In his twenty-eighth chapter he says, if the child is large, the os uteri must be dilated; if the hand or foot presents, neither must be laid hold on; but the operator, introducing his hand to the buttock or shoulder, must reduce the fœtus into the natural situation, that is, so as to present with the head. His thirtieth chapter contains directions for extracting the placenta when it adheres: The os uteri must be dilated, and the accoucheur taking hold of the funis, must pull gently from side to side, lest the uterus should be brought down; then more strength

must be exerted by degrees, until the secundines are brought away. His thirty-second chapter treats of monsters.

Ludovicus Bonaciolus of Ferrara is the fifth: His works were published at Strasburg.

The sixth is Jacobus Silvius, of Amiens in Picardy.

Then comes Jacobus Rueff, who published at Zurich in Switzerland, and afterwards at Frankfort. He is the first who gives a draught of the speculum matricis for dilating the os internum, which he directs to be stretched in width; but by no means lengthwise, lest, the ligaments breaking, the womb should fall down. When the feet present, and the hands are stretched along the sides, he advises us to deliver footling; but if the hands are up over the head, he says the child ought not to be brought by the feet, unless the head be very small. If the knees present, he orders them to be pushed up, and the child to be delivered by the feet; but if the breech comes first, it must be reduced, and the fœtus brought by the head. The same practice he recommends in the presentation of the hands, shoulder, or hands and feet together.

He is succeeded by Hieron. Mercurialis, who lived at Padua, Venice, and Bologna, and practised much in the same manner.

The ninth is Johannes Baptista Montanus of Padua.

Victor Trincavillius of Venice is the next.

Albertus Bottonus of Padua is the eleventh.

After him comes Joannes le bon Heteropolitanus.

The author who holds the next place in this collection is Ambrosius Paræus, the famous restorer and improver of Midwifery: He lived at Paris, and his works were translated into Latin by Jacob. Guillimeau.

Next to him Spachius places Albucasis the Arabian, already mentioned. Then

Franciscus Roussetus, who wrote on the Cæsarian operation: His work was translated from French by

Casparus Bauhinus; and several of his cases are published in the 'Memoirs of the Academy of Surgeons,' by M. Simon.

There is also the figure of a petrified child extracted from the womb after the death of the mother; a particular account of which is added to Cordæus's comment upon Hippocrates.

Casparus Bauhinus professor at Basil is the sixteenth.

Then Mauritius Cordæus of Rheims and Paris.

The next is Martinus Akakia, and the last is Ludovicus Mercatus, a Spaniard.——This author says, if the child does not present with the head or feet, the case is dangerous, and preternatural; nor is the presentation of the feet without hazard and difficulty. In laborious cases, if the woman be young and vigorous, he prescribes bleeding in the foot, after Hippocrates; but is against the use of the bath.

If the fœtus comes double, or presents wrong, he directs us to push it up, and bring down the head, if possible, which ought also to be our aim when the hand or foot presents. He orders the fingers to be introduced, as Paulus directs (*digitis in unum conductis*), that is, the fingers and thumb formed into the shape of a cone. He exclaims against the Cæsarian operation as an unchristian undertaking; directs us, when the placenta adheres, to introduce the hand, and pull the funis gently from side to side; and recommends sneezing to the woman, as conducive to its expulsion.

When he treats of the manner of extracting a dead child, he says, with Aetius, we ought first to consider whether or not the woman has strength sufficient to bear the operation; then gives the method of Hippocrates, and in the next page describes the manner of Aetius.

Having thus given a short sketch of the authors collected by Spachius, I shall return to Paræus, who (as I have already hinted) was the first modern that made any con-

siderable improvements in midwifery; which continued to his time without any material alteration, even after the other branches of physic had been improved. For example, if the child did not present in the natural way, they shook and altered the position of the woman, by which means they imagined the fœtus would turn to the right posture; or they attempted to move it so as that it should present with the head: If this could not be effected, and the feet were near at hand, they brought it footling: but if they failed in this attempt, the child was supposed to be dead, and extracted with crotches and hooks of various kinds; and if it could not be delivered in that manner, on account of its extraordinary size or the narrowness of the pelvis, they dismembered and separated the body with crooked and straight knives, and then extracted it piece-meal.

Paræus was the first who deviated from this practice, and expressly orders the child to be turned and brought away by the feet in all preternatural cases. He says, the most natural case is that in which the child presents with the head, and is delivered immediately on the discharge of the waters: it is more difficult when the fœtus comes by the feet; and still more so in the presentation of the arm and legs together, the back, belly, arm alone, or any other unnatural position. He directs us to bring away the secundines immediately after the child is delivered: he retains the old notions relating to the diseases and medicines; for the ancient theory was not altered till after the great Harvey found out the circulation of the blood.

Contemporary with him was the abovementioned Jacobus Rueff, who practised at Frankfort, and in his writings recommends the method of the ancients; a circumstance from which we learn, that the improvements had not then reached Germany. Indeed they were very much retarded by the false modesty of the women, who were shy of male practitioners, and by the mistaken notions which were at

that time entertained of the structure of the uterus; for all the descriptions till the time of Vesalius were very imperfect; and the womb in women supposed to be formed of different cells, resembling those of the brute species.

[The title of Rueff's treatise was 'De Conceptu et Generatione Hominis.' This James Rueff was a surgeon practising at Zurich, where the first edition of his work appeared in 1554, and another edition was published at Frankfort in 1587. It was translated into English under the title of 'The Expert Midwife.' A copy lent me by Professor Sinclair, bound in calf, and of small quarto size, is dated London, 1637, and contains 312 pages (in two series, the first of 192 and the second of 120 pages). It is printed in Roman character, and the name of the translator or editor is not given, all that is said on this point being "that it is translated into English for the good and benefit of the nation." It contains some woodcuts closely resembling those in Raynalde, but a shade better in point of execution. It is divided into six books, which treat of generation, the anatomy of the female sexual organs, and of the gravid uterus; the growth and development of the "feature" (fœtus): labour; "aborcements;" moles; diseases and sterility. The use of the lying-in stool or chair is recommended, and, curious to say, the position of the patient and attendants is very similar to that represented in the piece of sculpture found among the ruins of a temple of Venus in the island of Cyprus, and supposed to be of the date 300 B.C. A cast of this ancient sculpture was presented to the Dublin Obstetrical Society by Mr. S. H. Bibby, of London, and a representation of it is given at page 123 of 'The Dublin Medical Journal' for February, 1875.

In the general plan of his treatise, as well as in the practical details, Rueff closely follows Rhodion and Raynald, but he pictures and describes four instruments, two for dilating the os uteri and two for extracting the fœtus. The two former he calls *speculum matricis* and *apertorium*, and the two latter *rostrum anatis*, the ducke or drake's-bil, and *forceps longa et tersa*. These instruments are all so plainly inadequate to be of any practical utility, that one can hardly suppose the inventor to have made trial of them in any difficult case. He speaks of retention of the placenta and of its consequences just as does Raynalde, but says almost nothing of its extraction by manual operation.

There is a vague allusion in one place to *placenta prævia*, but nothing is said of its danger or of the attendant hæmorrhage. Here is the passage:—"But if the secundine or afterbirth come forth before the child, and hinder and let the passage of the infant, that shall be cut off, but the navel must be bound up, and this pessary following must be conveyed into the neck or privie passage of the matrix." When the child presents with both feet he advises delivering it so, and this is certainly a decided improvement on Raynalde's proposal to convert the case into one of head presentation. In all other matters relating to parturition Rueff follows Raynalde. Perhaps the only original feature in the work is the recognition of pudendal hæmatocele (labial thrombus or bloody tumour of the labium) as an occasional complication of labour. The first British author who described this occurrence was Dr. David McBride, of Dublin, in a communication to Dr. William Hunter, September, 1772, which was published in 1776 in the fifth volume of 'The Medical Observations and Inquiries.' The passage in the 'Expert Midwife' runs thus: "But if it shall happen that some swelling or congealed blood doe appeare in the foreskins of the matrix under the skinne, arising from the paines and difficulty of the birth, the Veines or Fibres being broken because of overmuch dilatation, opening, and enlargement, as it falleth out: or some inward swelling or tumour of blood shall be bred, by which both the child and secundines or afterbirth are wont to be hindered very much before the birth, let the midwife make incision of that tumour and open it with a clean knife, when the matter shall be perceived to be digested and ripe, whether it shall appeare before or after the birth, let her squeeze out the clotted blood, and let her press down the swelling, wipe and cleanse those things which are defiled, and let her bring forth the child as she may, if it shall be unborne as yet" (page 108).

A long chapter is occupied discussing whether men or women can cohabit with devils or spirits, and so engender offspring.]

Jacobus Guillemeau was the pupil of Ambrosius Paræus, adopted and confirmed his master's practice, and has written with learning and judgment.

[Guillemeau's treatise was entitled 'L'Heureux Accouchement,' and appeared about the year 1598 along with his other writings on pregnancy and childbed. This work was translated into English,

and published at London in 1635, in a small quarto volume, with the title, 'Childbirth, or the happy Delivery of Women.' The translator withholds his name, though he gives a preface. Bound up in the same volume, and published at the same time and place (but paged separately), is a treatise on 'The Nursing of Children," translated from the writings of Guillemeau.

Although this work contains very many of the erroneous and superstitious notions of the ancients, yet, on the other hand, we find in it some sound practical precepts, plainly showing that the author wrote from experience and observation. For example, he enjoins on the midwife to be very careful not to break the membranes till the labour is well advanced. He distinctly recognises the prolapse of the urinary bladder, which sometimes occurs in the second stage of labour, retarding the advance of the head, and he particularly cautions us against mistaking it for the membranes, through which mistake he had known the "bladder to be broken : the which is worthy of great consideration." He does not advise the chair or stool for delivery, but directs the woman to be delivered in the dorsal position, on a small bed or couch, having a strong footboard which she may press against with her feet. He describes the mode of extracting the placenta by the hand, and gives some instructions on this point that prove he was well acquainted with this operation, such as that the finger nails of the "chirurgeon" should be pared very close and even, and that he should take especial care "not to draw the placenta forth suddenly all at once" (a caution too often disregarded by young or hasty practitioners), which might cause a "precipitation of the womb," or a flux of blood; and ulcers "whereof may follow a gangrene and oftentimes death." Where the afterbirth is left behind in the womb he says, in quaint but concise language, that "one of these two accidents must needs follow, either that the quicke (which is the wombe) thrust forth the dead (which is the afterbirth), or that the dead kill the quicke." He pictures an "iron crochet" to be used for extracting dead children, presenting with the head, and lays down some rules for its employment. A number of rude woodcuts are given to show the position of the fœtus under different presentations. They bear a very close resemblance, in every respect, to the illustrations of Raynalde and Rueff, and are just as far removed from a true representation of the attitudes of the child in utero. Where there is profuse hæmorrhage at the time of labour he strongly urges immediate delivery by turning,

and he seems aware of the fact that the placenta may present and cause dangerous bleeding, which demands speedy delivery. He elsewhere notices hæmorrhage occurring where the membranes and a bit or edge of the placenta present; but I do not find that he recognises the efficacy of rupturing the membranes for the suppression of this "accidental" form of hæmorrhage. He expresses strong disapproval of Cæsarian section on a living woman, in consequence of its almost necessarily fatal result. Contrary to the teaching of Hippocrates, Guillemeau maintains that primiparous women are less liable to after-pains than are multiparæ; and no doubt here he is correct, and the father of medicine is wrong. He maintains different remedies for after-pains, but opium is not among them. Post-partum hæmorrhage receives no consideration, but excessive lochial discharge, its causes, and treatment, are noticed.]

About the end of the 16th century, or in Paræus's time, surgery in general was more cultivated and improved in Paris than any other part of the world, by means of the hospitals which had been from time to time erected, especially the Hôtel Dieu, into which poor women with child, destitute of the necessaries of life, were admitted.

By such opportunities, the surgeons improved their knowledge in midwifery, and by degrees established a better method of practice; the success that attended which, together with the progress of polite literature, that began to flourish about this time in France, got the better of those ridiculous prejudices which the fair sex had been used to entertain, and they had recourse to the assistance of men in all difficult cases of midwifery. This conduct was justified by experience: and the lives of many women and children were saved by the skill of the man-practitioner.

[In this historical sketch of the leading writers upon midwifery and consequently of the art itself, it may be worth while mentioning a circumstance which contributed very materially to bring the management of natural labours (hitherto conducted almost exclusively by female practitioners) under the care of surgeons and physicians, as it was not till medical men had opportunities of

studying natural or physiological parturition that real improvement in the science and art of midwifery began. Hence, such an event may well be regarded as a conspicuous epoch in obstetrical annals. I record the circumstance alluded to on the authority of Astruc ('L'Art D'Accoucher, reduit a Ses Principes,' Paris, 1768, page xxxviii.) When Madame La Vallière, a favourite mistress of Louis XIV, was about to be confined of her first child, in 1663, she sent for Jules Clement, a surgeon of eminence in Paris, to attend her, as she wished to observe the strictest secrecy. During the progress of her labour, the king's concern for the patient caused him to observe, from behind a curtain, all that passed, and he was vastly pleased with the skill and attention which Clement displayed on this occasion. The accouchement ended happily in the birth of a boy, who was named Louis de Bourbon, and who died some years afterwards. Clement was employed in other confinements of the same lady, when this secrecy was not observed, and when the result was equally successful. As a natural consequence he rose high in favour at the court, and many of the highest ladies of rank got him to attend them in their accouchements, so that it soon became the fashion to employ surgeons on like occasions, and the appellation of *accoucheurs* was invented to distinguish this class of medical practitioners. In the preface to his 'Practique des Accouchemens,' M. Peu gives the copy of a certificate of approbation from Clement, in which the latter styles himself, "Accoucheur de feué Madame la Dauphine et des Princesses de France, et Maitre Chirurgien juré et Paris," &c. &c. This Jules Clement, though a surgeon of high repute in his day, was not an author, and left no writings upon any subject connected with medicine or surgery. Puzos was a pupil of his, and speaks highly of his skill and judgment.]

In the year 1668, Francis Mauriceau, after an extensive practice for several years in the Hôtel Dieu and city of Paris, published a treatise on midwifery, which exceeded every thing before made public on that subject. He describes the bones of the pelvis, and all the parts subservient to generation; the diseases incident to pregnant women, with the methods of prevention and cure; and, after having given a full and distinct account of all the different labours, and the way of delivering in each case,

concludes his work with the diseases of women and children.

His method of practice was nearly the same with that of Paræus and Guillemeau; but he is much fuller than either. In laborious cases, when the head presents, and cannot be delivered by the labour-pains, he orders a fillet or strip of linen to be slit in the middle, and slipped over the head: this contrivance hath since been improved with laces, by which it is contracted on the head. It is introduced by three different instruments, fixed with a great deal of trouble, and, after all, of very little use.

He also invented a tire-tête, which cannot be applied until the skull is opened with a knife; consequently can be of no service in saving the child: and granting the fœtus to be dead, other methods are much more effectual. He was ignorant of the forceps. When the head is left in the uterus, he advises us to extract it, by introducing over it a broad fillet like a sling.

He is so full on the diseases, that Boerhaave recommended him and Mercatus to his scholars on that subject. In his theory of conception, he hath not deviated from the opinions of Hippocrates; and in his second volume he hath published a great many judicious aphorisms, that are now translated into English by Mr. Jones: indeed, his writings were so universally approved, that they have been translated into several different languages.

Contemporary with Mauriceau were Dr. Chamberlen and his three sons, who practised midwifery in London with great reputation. One of these three sons, father to the late Dr. Hugh Chamberlen, translated the first volume of Mauriceau into English; and in a note upon that author's method of extracting the child by the help of the crotchet and tire-tête, affirms, that his father, brothers, and himself, were in possession of a much better contrivance for that purpose.

This was no other than the forceps, which they kept as a nostrum, and was not generally known till the year 1733, when a description of the instrument was published by Chapman. Long before that period indeed, several kinds of foreeps or extractors, different from those mentioned by the Arabians, were used in Franee, Germany, and other places; but all of them fell short of the instrument used by the Chamberlens, and said to be eontrived by the uncle.

[As stated by our author, Maurieeau's admirable work (or rather the first or preeeptive part of it, for the eases did not eome out till 1706) was translated into English by Dr. Hugh Chamberlen. This was the same physieian who is mentioned by Maurieeau, in his twenty-sixth ease, as having eome to Paris and vainly tried by some seeret means to deliver a woman with distorted pelvis. He was the eldest son of Dr. Peter Chamberlen, who, as shall presently be shown, was undoubtedly the inventor of the midwifery foreeps. The first edition of this translation of Maurieeau was published at London in 1672. Copies of this edition are extremely searee, but I am fortunate enough to have one in my possession. It is a small oetavo volume of 437 pages; and on the lower part of the title-page we find this statement: "Written in Freneh by Franeis Maurieeau; Translated and enlarged, with some Marginal Notes, by Hugh Chamberlen, M.D. and Physieian in Ordinary to His Majesty." This work went through several editions: I have a eopy of the seventh, a full-sized oetavo, published in 1736, and it seems to be only a reprint of the first edition; even the translator's preface is introduced without alteration and without a date, although it contains the statement that "his father and two brothers are still living," whereas his father had died in 1683, and the writer himself (Dr. Hugh Chamberlen) must also have died long before the issue of this edition, as he was born about 1626.

The "marginal notes" of the translator are very few and very brief; some of them have referenee only to the seeret means possessed by him and his family, "of fetehing a ehild when it eomes right without hooks or turning it."

It is now universally admitted that the foreeps was the seeret means of delivery so long and so profitably employed by the Chamberlens, and that some one of their family—five generations of whom

were eminent in the medical profession—was really the inventor of this noble instrument, which has done more to abridge human suffering, and to save human life, than any other instrument in the whole range of surgical appliances. Nay, more, the acquisition of this efficacious resource contributed most influentially to open up a new era in midwifery, by rescuing it from the hands of ignorant female practitioners. This discovery of the forceps, therefore, may fairly be regarded as *the* most salient and important epoch in the history of obstetrics. To Dr. *Paul* Chamberlen the honour of this invention has been attributed by Ramsbotham, Churchill, Leishman, and a host of other eminent writers. But the careful and discriminating researches of Dr. Aveling have, to my mind, irrefragably established the claim of Dr. Peter Chamberlen (father of Hugh and Paul) to this high distinction.[1] Had he published, for the benefit of mankind, his discovery, instead of keeping it a close secret for the purpose of aggrandising himself and his family, Chamberlen would have conferred honour on his profession and entitled himself to everlasting gratitude as one of the greatest benefactors of the human race.

What seems to have given rise to the idea of Paul Chamberlen having been the inventor of the instrument, is the existence of an old print with the legend underneath, "Dr. Paul Chamberlin, 1658." Now, let us see—will this evidence bear examination? The face of the portrait is plainly that of an elderly man, about sixty years of age; but Paul Chamberlen was only six- or seven-and-twenty in the year 1658, whereas his father, Dr. Peter Chamberlen, was then fifty-seven. The portrait may truly have been that of Dr. Paul Chamberlen, but, if so, the year 1658 is manifestly an error, and should most probably have been 1698, as he died about 1715. The original painting could not have been underlined, and the error in naming or dating the portrait was most probably made by the publisher (W. Richardson, Castle Street, Leicester Square), who brought out the print May 30th, 1794, and as he spelled the name wrongly (using an "i" instead of an "e" in the final syllable), it is probable he also made a mistake in the Christian name or the date. The engraver's sketch is in the possession of the Royal Medical and Chirurgical Society of London, and has the same inscription underneath it.]

[1] For further information on this point let me refer the reader to the 'British Obstetric Journal' for January, 1875.

In the last century, although there were such excellent practitioners in London, and even before the translation of Mauriceau, Guillemeau's book on midwifery had been translated into English; and in it all the absurd notions about spells and amulets were left out: nevertheless one Nicholas Culpepper, who styles himself Gent. student in physic and astronomy, published at London a book entitled, 'A Directory for Midwives;' in which he has copied the theory and practice of the old writers, many of whom he mentions, namely, Hippocrates, Galen, Aetius, &c. and frequently advises the reader to consult his translations of Sennertus, Riverius, Riolanus, Bartholin, Johnston, Veslingius, Rulandus, Sanctorius, Cole, the London Dispensatory, and a book which he himself had published under the title of 'The English Physician.' His performances were for many years in great vogue with the midwives, and are still read by the lower sort, whose heads are weak enough to admit such ridiculous notions.

He was succeeded in that way of writing by one Dr. Salmon, who was also a great translator and compiler. He was partly author of a spurious piece called 'Aristotle's Midwifery,' which hath undergone a great many editions, and contributed to keep up the belief of the marvellous effects of various medicines.

Mauriceau, in 1706, published a second volume, containing about eight hundred observations; but, long before that period, he had gained such reputation by his writings as encouraged others of the same nation to write on the same subject. Accordingly, we have the works of Portal, Peu, and Dionis; but all of them fall short of Mauriceau. About this time also Saviard wrote several observations on the same art.

[Three eminent French obstetricians are here disposed of by our author in a single line. A few words may be said about each of

them. Paul Portal's work, 'La Pratique des Accouchemens," was published in 1682. An English translation issued from the press in 1763, under the name of 'The Compleat Practice of Men and Women Midwives; or, The True Manner of Assisting a Woman in Childbearing.' The translator's name is not given. No attempt at systematic order or arrangement is observed in this work, and the main bulk of the matter it contains, is made up of cases, of which eighty-one are narrated, illustrating most of the varieties and complications incidental to childbirth. A short introductory chapter lays down brief directions for the management of labours, natural and preternatural. Portal would seem to have been a judicious practitioner, and some of his precepts show him to have been a man who profited by experience; thus, he discountenances any meddling with face presentations; says there is nothing to be gained by pushing up the arm before version of the child, in transverse presentations; that to seize one leg or foot is enough for the purpose of turning; and he distinctly states that the placenta may be attached over the mouth of the womb, and thus cause dangerous flooding.

In the estimation of M. Velpeau the work of Philip Peu was the best didactic treatise on midwifery, which had appeared up to the time of its publication in 1694, but on this point I cannot agree with him, as I think it was not equal to the work of Mauriceau. Its title was 'La Pratique des Accouchemens,' and the author takes for the motto of his book, "*Sat cito si sat bene*"—a maxim well worthy of remembrance in the lying-in chamber. This treatise was sent forth with many "privileges" and "approbations," amongst others one from Jules Clement, of whom mention has already been made; so that if these be any guarantee of merit, Peu's book should be an admirable one. It is a well-arranged, well-digested treatise, bearing the marks of great care in its preparation but he is rather prolix, and devotes too much space to matters of small importance. I am not aware that any English translation of this treatise ever appeared. Mauriceau seems to have held Peu in very small estimation, punning on his name as "*omen in nomine.*" The religious element is very prominent in his book, and every one who would wish for directions as to the most orthodox method of administering the sacrament of baptism to an infant *in utero*, will do well to consult this treatise. Peu thinks that the pelvic articulations not uncommonly yield in labour. He rather prides himself on his mode-

of using the crotchet, which he preferred fixing in the ear, instead of the orbit, mouth, or chin.

The author next coming under our notice is Dionis, whose 'Traité Général des Accouchements' was published at Paris in 1718. An English translation of it, by an unknown hand, appeared in 1719. It was a convenient work for reference, written in a pleasant, easy style, but does not contain any new fact or doctrine, except it be the advice to rupture the membranes for hæmorrhage at the time of labour. He disapproves of the practice of debarring a newly delivered woman from sleep, and he is a determined opponent of Cæsarian section, where the woman is still alive. "'Tis evident," he writes, "that the operation is by no means to be performed till the woman is dead; and that those who are so bold as to venture upon it while she is alive, deserve to be severely punished for butchering of her after this manner." One of the concluding chapters of the book is devoted to urging the various reasons, physiological and moral, why mothers should nurse their children, unless some serious objections stand in the way.]

Henry Deventer practised at Dort in Holland; and in 1701 published a book on midwifery. He observed, that an imaginary straight line falling down from the navel would pass through the middle of the pelvis. This will nearly hold true when the abdomen is not distended; but in the last month of uterine gestation, in order to pass through the middle of the pelvis, such a line must be let fall from the middle space betwixt the navel and scrobiculus cordis. This, however, was a good hint, and useful in practice.

He pretends to have made several useful discoveries, which seem feasible enough to those who have not had the opportunity of an extensive practice; such as the side or wrong positions of the os internum and fundus uteri, which (according to him) are chiefly the occasion of lingering, difficult, and dangerous labours. He seems to have been led into this mistake, by supposing that the placenta always adhered to the fundus uteri. As to the difficulties proceeding from the wrong position of the os internum, a prac-

titioner would be apt to believe he had never waited for the effect of the labour-pains, which generally open it, by pushing down the waters or head of the child.

He was seldom called except in difficult cases, often proceeding from a distorted pelvis, which is common in Holland. When this is the case, the head of the child is commonly cast forwards over the pubis by the jetting in of the sacrum; or if one ilium is higher than the other, the os internum and fundus are thrown to different sides; but even then the chief difficulty is owing to the narrowness of the pelvis. The uterus is very seldom turned so oblique as he supposes it to be; or if it were, provided the child is not too large, nor the pelvis narrow, I never found those difficulties he seems to have met with: and should the labour prove tedious on account of a pendulous belly, by altering the woman's position, the obstacle is commonly removed.

For example: let her breech be raised higher than her shoulders; or she may be laid upon her side, in a preternatural case, when it is necessary to turn and deliver the child by the feet. Nevertheless, though he has run into extremes about the wrong positions of the uterus, in which he is the more excusable, as he had the fondness of a parent for a theory that he alleges was his own, yet there are some very useful hints in his book, particularly that about floodings, in which he directs us to break the membranes in order to restrain the hæmorrhagy; and his method of dilating the os externum.

["Nothing is more clear," remarks Dr. Leishman, "on a careful examination of his (Deventer's) work than this, that he has rested his conclusions more on theory than on fact; and, indeed, to the reader of the present day, the pertinacity with which he imputes to obliquities of the womb, almost all the evils to which parturient flesh is heir to, appears truly absurd." It finds some parallel in the views of those modern gynæcologists, who regard flexions of the uterus as the

prolific source of numberless ailments, in the virgin, pregnant and non-pregnant states.]

The next noted writer in this way is Lamotte, who lived at Valognes, near Caen in Normandy, and in 1715 published a book on midwifery, which seems to be the best of the kind since Mauriceau, and is translated into English by Mr. Tomkins. It contains about four hundred observations, the greatest part of which are illustrated with many judicious reflections.

In describing a case in which the head presented, he mentions the great fatigue it had cost him to turn and deliver by the feet; and hopes that some easier method will be found out for extracting the child in such circumstances: so that, although he wrote so lately, he must have been ignorant of the forceps. He, as well as Deventer, exclaims against the use of instruments; and in most laborious cases, when the head presented, turned and extracted the fœtus by the feet.

A number of such cases he has recounted; but I am afraid that, like other writers, he has concealed those that would have been more useful to the young practitioner, and only given a detail of his own that were successful: for certain it is the head of the child is often so large, or the pelvis so narrow, that labour-pains cannot possibly force it away; and frequently, when the fœtus hath been turned with great fatigue, and the body actually extracted, the force required to deliver the head with the hands alone is such as destroys the child; and sometimes it is absolutely impossible to bring it along without the help of instruments.

For my own part, when I first began to practise, I determined to follow the method of those gentlemen; but having by these means lost several children, and sometimes the mother, I began to alter my opinion, and consult my own reason; in consequence of which, in cases of such emer-

geney, I opened the head, with a view of saving the woman if I could not preserve the life of the child. In the course of my deliberations on this subject, I likewise tried to improve upon the forceps, which seemed to me an instrument more mechanically adapted and easier applied than any other contrivance hitherto used: and surely experience justifies the use of this expedient, by which we are enabled to save many children which otherwise must have been destroyed.

Not that I would be thought to exult over those authors whom I have mentioned, as mostly enemies to all instruments whatever: in other things they have written very judiciously; and are blame-worthy in nothing so much as in having suppressed those unsuccessful cases which must have happened to men of their extensive practice.

I own indeed, when the woman has not strength nor pains sufficient to force along the child, and the difficulty does not proceed from a large head or narrow pelvis, the method of turning will prove successful; but, if in the other extreme, I appeal to all candid practitioners, whether many children are not lost, even when the head does not present, and when the body is first brought down, because the fœtus cannot be delivered in another manner.

The next writer in Midwifery is M. Amand of Paris, who describes the method of extracting the head, when left in the uterus, by means of a net. The contrivance is ingenious but is not applied without great trouble, and cannot succeed when the pelvis is too narrow, or the head too large to pass.

[The work of Pierre Amand, entitled, 'Nouvelles Observations sur la Pratique des Accouchemens,' &c., &c., contains only the one original feature, viz., a description of his *tire-tête*, or *machine* for extracting the fœtal head when separated from the body and retained in the uterus. This work was published at Paris in 1713; and the fact of his giving on the title page minute particulars as to

his address, in addition to his name, would seem to savour somewhat of the quack. The first forty pages are taken up with a series of questions and answers (a catechism in fact) on practical midwifery; and then follow one hundred and twenty-one clinical histories, and a full description, with four illustrations, of his net or *nouvelle machine*. He relates a case where the heads of twins were left in utero, and by means of his net their extraction was safely effected. In order to include the head in the net, the hand of the accoucheur, with the net spread over the back of it, had to be carried within the uterus above and around the head: by means of a string the net was kept in this situation while the hand was withdrawn. The objections to this contrivance are patent, and it never came into use.]

Edmund Chapman practised midwifery several years in the country before he settled in London; where, in 1733, he published a short account of the practice of midwifery, illustrated with about fifty cases; and is the first person who made public a description of the forceps used by the Chamberlens.

[Although Chapman appears to have been the first to publish an account of the forceps, and the mode of using it, yet he himself does not set up any claim for originality in this respect, and he speaks of the instrument as though it were no secret. In the second edition of his treatise, published only two years after the first, we find him remarking that already there were "several different sorts of forceps." He also speaks of the forceps as being "now well known to all the principal men of the profession, both in town and country." Hence, I infer, that it is claiming too much for him to say, as a recent writer has done, that to Edward Chapman "is due the credit of first making Chamberlen's secret known to the profession." Chapman undoubtedly improved the construction of the forceps, by making it of hard instead of soft iron, and also by substituting an open, though very imperfect, lock for a riveted one. Mr. Drinkwater, of Brentford, is supposed to be one of the first accoucheurs who used the instrument after the Chamberlens. He died in 1728. Giffard (who died in 1731) also employed the instrument in his practice.]

Giffard's observations were published in the following

year, by Dr. Hody, containing many useful remarks and histories of cases in which he had used the extractors or forceps.

Heister, professor at Helmstadt, a little town in the dukedom of Brunswick, in the year 1739, published at Amsterdam a treatise on surgery; in which we find a very concise and distinct account of the practice of midwifery, as well as of the Cæsarian operation.

Mr. Ould surgeon in Dublin in the year 1742, published a treatise on the practice of midwifery: in which there are two good observations; one relating to a case in which the head presents, and the other specifying what is to be done when delivery is retarded by the twisting of the funis round the neck of the child. He prefers his terebra occulta to the scissars, probably because he did not know the proper dimensions of this last instrument.

[Mr. (afterwards Sir Fielding) Ould was the immediate successor of Moss, the founder and first Master of the Dublin Lying-in Hospital. With him commenced the literary reputation of the Dublin School of Midwifery. He was born about the year 1710, and settled down to practice in Dublin, about 1737, chiefly devoting himself to midwifery. Prior to this, and while yet but a novice, he made the observation of the lateral position of the fœtal head in labour—a discovery of the highest practical importance, and the *punctum saliens*, as Rigby calls it, of all our knowledge respecting the mechanism of parturition; in fact it lies at the very foundation of all modern obstetric science. "It is beyond a doubt," writes Dr. Leishman, "that the theory of the mechanism of labour, propounded by Ould, was, as we shall see, very erroneous; but to him the credit is manifestly due of having made the first step in the observation of nature, on which was gradually reared the superstructure which we now call the theory of the mechanism of parturition." His 'Treatise upon Midwifery,' 8vo, was published at Dublin in 1742. Besides the observation just mentioned, his work possessed other features of novelty and showed much originality of thought. He maintains that the thickness of the uterine parietes, contrary to what Mauriceau and others strenuously contended for,

does not diminish but rather increases with the advance of gestation. He successfully combats the theoretical views of Deventer, relative to the influence of obliquity of the uterus as a cause of difficult labour. "It surprises me," he exclaims, "that a man should impose on the learned world in a matter so demonstrably false." He also very strongly disapproves of Deventer's rule, that the placenta should be manually extracted immediately after the birth of the fœtus, and points out very clearly the grave objections to such a proceeding on ordinary occasions. His instrument for opening the head—viz., the *terebra occulta*, though completely superseded by the perforator, was nevertheless a great improvement on the instruments then in use for that purpose. He recommends podalic version where there is narrowing of the pelvis, and records a case in which he actually put this plan in practice. According to Churchill, he was the first British author who noticed Cæsarian section, the mother being alive; but he condemns the operation as a "detestable, barbarous, and illegal piece of inhumanity." He mentions with approval incision of the perineum in certain cases of extreme rigidity; and also suture of the perineum after delivery when laceration has happened. He anticipated Dr. Figg in suggesting the question "whether it would not be laudable in the beginning of all labours, how natural soever, to deliver by turning?" But, unlike that obstetrician, he did not put his suggestion into practice. "However," says Ould, "this is an innovation that I shall not pretend to enter into the merits of." ('Midwifery,' p. 82.) Every part of his work gives evidence of mental vigour and accurate observation. Ould was knighted in 1760 by the Duke of Bedford, the then Viceroy of Ireland. His professional career was one of unusual length, exceeding half a century; during which period he had among his clients many of our highest nobility; and there is the strongest evidence that it was he who attended the Countess of Mornington, at Mornington House, Upper Merrion Street, Dublin, on the occasion of the birth of the Marquess of Wellesley (afterwards Governor-General of India, and Viceroy of Ireland), and of the still more illustrious Arthur Duke of Wellington. Ould died in November, 1789. In the 'Dublin Quarterly Journal of Medical Science' for February, 1858, the reader will find a more extended notice of Ould, in a communication headed, 'On the rise of the Dublin School of Midwifery.']

The very next year, Mesnard published at Paris a book

on the same subject, by way of question and answer; and is the first who contrived the curved in lieu of the straight crotchets, which is a real improvement.

[Jacques Mesnard, of Rouen, published his 'Guide des Accoucheurs, ou Le Maistre dans l'Art d'Accoucher les Femmes,' &c., at Paris in 1743; and a second edition appeared some years later. This treatise is in the form of question and answer, and is illustrated with several very tolerable engravings. He invented a kind of forceps which he called *La tenette en cuillier*, which consisted of two branches that were separately applied to the head, and the handles, without being crossed, were then connected and held together with a sort of pivot and nut. A delineation of this very imperfect instrument is given in Mulder's 'History of the Forceps,' fig. 6, Tab. ii. Mesnard gave a curve to the crotchet (which Smellie considered of great advantage), and he recommended the use of a double crotchet, the two being united after their application, in the same way as his forceps. This double crotchet Smellie greatly improved, adapting the two branches to each other by a lock, the same as that of his forceps; thus modified, he often employed the double crotchet, and thought it a very efficient instrument for extracting dead children. Mesnard further describes and pictures a flat sharp-pointed instrument, which he calls a *peree-crane*, for opening the head of the fœtus. This instrument is essentially the same as Mr. Roberton's spear-pointed perforator, except that the latter is longer in the handle, and that its point is very slightly curved to one side. Mesnard's book is written in a clear style, and his teaching is generally good. For laceration of the perineum extending to the rectum, he very properly advises us to employ the interrupted suture, using a curved needle which should pass deeply in the flesh.]

Over and above the writings of those authors whom I have mentioned, there are a great many curious and extraordinary observations on the practice of this art in Shenckius, Hildanus, Bonetus, the 'Philosophical Transsactions,' the Academies of Sciences and of Surgeons, and the 'Medical Essays of Edinburgh': and besides these, the best modern authors who have written on the diseases

of women and children, are Sydenham, Harris, Boerhaave, Friend, Hamilton, Hoffman, and Shaw.

On the whole, that the young practitioner may not be misled by the useless theories and uncertain conjectures of both ancient and modern writers, it may be necessary to observe in general, that all the hypotheses hitherto espoused are liable to many material objections; and that almost every system hath been overthrown by that which followed it.

This will probably be always the case: and indeed, as theory is but of little service towards ascertaining the diagnostics and cure of diseases, or improving the practice of midwifery, such inquiries are the less material. What Hippocrates has written about the form of the uterus and its various motions, conception, the formation of the child, the seventh and eighth month's births, was believed as infallible till the last century, when his doctrine of conception and the nutrition of the fœtus was overthrown; and many new and uncertain theories, on the same subject, introduced.

Some of the moderns conclude, that the ancients never turned and brought children by the feet, because Hippocrates directs us, in all cases, to bring the head into the natural situation; and says, that when delivery is performed by the feet, both mother and child are in imminent danger. Celsus, and all the writers till the time of Paræus, adopted this practice of bringing the head to present; but, at the same time, many of them observe, that if this be not practicable, we must search for the feet, and deliver the fœtus in that manner. Celsus says, if the feet are at hand, the child is easily delivered footling: and Philumenus goes still farther, saying that if even the head should present, and the child cannot be delivered in that position, we must turn and bring it by the feet.

With regard to the fillet and forceps, they have been

alleged to be late inventions; yet we find Avicenna recommending the use of both. The forceps recommended by Avicenna is plainly intended to save the fœtus; for he says, if it cannot be extracted by this instrument, the head must be opened, and the same method used which he describes in his chapter on the delivery of dead children.

To conclude, we find among the ancients several valuable jewels, buried under the rubbish of ignorance and superstition; because the assistance of men was seldom solicited in cases of midwifery till the last extremity: And those disadvantages being considered, we ought to be surprised at finding so many excellent observations in the course of their practice; and be ashamed of ourselves for the little improvement we have made in so many centuries, notwithstanding our opportunities and the advantages we had from their experience.

True it is, we have established a better method of delivering in laborious and preternatural cases; by which many children are saved that must have been destroyed by their manner of practice: but are not many modern practitioners justly branded for their sordid and unsocial principles, in professing nostrums, both with regard to medicine and methods of delivery? Insomuch, that I have heard a gentleman of eminence in one of the branches of medicine affirm, that he never knew one person of our profession who did not pretend to be in possession of some secret or another: from whence he concluded, that we were altogether a body of empiries. Such reflections ought to make a suitable impression upon the minds of the honest and ingenuous, prompt them to lay aside all such pitiful selfish considerations, and for the future act with openness and candour; which cannot fail of redounding to the honour of the profession and the good of society, as well as their own advantage.

A

TREATISE OF MIDWIFERY.

BOOK I.

CHAPTER I.

THE STRUCTURE AND FORM OF THE PELVIS, SO FAR AS IT IS NECESSARY TO BE KNOWN IN THE PRACTICE OF MIDWIFERY.

SECT. I.—*Of the Bones.*

THE pelvis is composed of three bones; the os sacrum, with its appendix known by the name of coccyx, and the two ossa innominata. The sacrum in children is divided into five distinct bones, and the coccyx into four cartilages; but, in adults, these last are formed into as many moveable bones, and the divisions of the sacrum ossified so as to become one bone.

Each os innominatum is, in infants, composed of three different bones, under the appellation of *os ilium*, *ischium*, and *pubis;* which are joined to one another at the acetabulum or cavity that receives the round head of the thigh-bone. This composition is, in point of figure, so irregular, that although in adults the three are ossified into one bone, those different names are still used, in order to distinguish one part of it from the other.

The ossa innominata of the opposite sides are joined to one another in the fore part at the pubes, by a thick

cartilage and strong ligaments; and the posterior part of each os ilium is connected with the upper and lateral part of the sacrum by the same apparatus.

Divers authors and practitioners in this art have alleged, that, towards the latter end of gestation, when all the parts of the abdomen are strongly pressed by the increased uterus, an extraordinary quantity of mucus is secreted, not only by the glands of the os internum and vagina, but also by those belonging to the cartilages and ligaments that connect the bones of the pelvis; by which means, the ligaments and cartilages are softened and relaxed, and the bones are separated from one another in time of labour. But, from experience and observation, I may venture to assert, that this separation is by no means a usual symptom, though sometimes it may happen; in which case the patient suffers great pain, and continues lame in those parts for a considerable time after delivery.

In some women, indeed, a kind of obscure motion may be perceived, when the child's head is forced into the pelvis, by strong pains: the junctures of the sacrum with the ossa ilium, as well as that of the ossa pubis, seem to yield a very little alternately, in order to accommodate themselves to the shape of the head, as it is squeezed down and passes through the pelvis; but the bones are not separated to any considerable distance. See Collect. I, Cases 1, 2.

[This question of the relaxation of the pelvic articulations during pregnancy has been investigated by Dr. Matthews Duncan, with his usual care and ability; and the following quotation from his chapter on the subject, contained in his 'Researches in Obstetrics,' will serve to show the general results at which he has arrived:

"But, although there can be no doubt as to the thickening and softening of the tissues forming the pelvic joints, there is great difference as to their capability of motion. In this country, indeed, most authors seem to think that motion in these joints, in pregnancy, is always to be considered the result of a morbid process.

This opinion is, without doubt, erroneous, although there are observed, not unfrequently, cases where the natural relaxation of these joints increases to such an extent as to interfere with the function of progression."

The slighter, physiological, degree of separation could not be detected in the living subject by any of the ordinary modes of examination; and where the separation has been considerable—and consequently easy of recognition—very unpleasant consequences, with marked symptoms, have been present. Examples of this latter class are given by Smellie, La Chapelle, Denman, and others. But such cases are extremely rare. In the course of a very large experience I have met with but two or three instances of what seemed to be morbid relaxation of the symphysis pubis, and I have never seen the sacro-iliac synchondrosis to be similarly affected. A motion is permitted to the sacrum in virtue of this loosening of its connections with the ilia, and this motion is one of slight rotation on an imaginary transverse axis through its second bone. When the body is strongly flexed forwards (as in the second stage of labour) the tip of the sacrum is tilted backwards, so as to increase the antero-posterior diameter of the outlet by three or four lines.]

The coccyx is moveable at its connection with the sacrum; as are also the four bones that compose it, in their articulations one with another; and this motion continues in adults, as well as in those of more tender years. In old age indeed, and even in young people who have suffered bruises upon the part, attended with great pain and inflammation, we frequently find the different pieces of this bone rigidly cemented together. But this anchylosis the more seldom happens, because they undergo a gentle motion at every excretion of the fæces, which helps to preserve their mobility. See Case 3.

Sect. 2.—*Brim, Outlet, and Axis of Pelvis.*

The brim or upper part of a well-shaped pelvis represents a kind of imperfect oval, or something that approaches a triangular figure. If we consider it as an oval, the long

axis passes from side to side; but, as a triangle, the posterior part forms one side, and the ossa pubis constitute the opposite angle: so that, behind, it is composed of the broad part of the sacrum, where it joins with the last vertebra of the loins; on each side, by the inferior parts of the ilia; and before, by the upper parts of the ossa pubis.

The lower circumference of the pelvis is formed, behind, by the inferior part of the sacrum and its appendage; on each side, by the lower part of each ischium, and a broad ligament which rises from the spine of that bone, and, with the coccygæus muscle, is inserted into the edge of the coccyx and the lower part of the sacrum; and before, by the inferior parts of the ossa pubis, and the two processes that descend on each side to join with those that rise from the ischia; by which conjunction the foramen magnum ischii is formed on each side.

When the body of a woman is reclined backwards, or half-sitting, half-lying, the brim of the pelvis is horizontal, and an imaginary straight line descending from the navel would pass through the middle of the cavity: but in the last month of pregnancy, such a line must take its rise from the middle space between the navel and the scrobiculus cordis, in order to pass through the same point of the pelvis. See the Anatomical Figures, Tab. I, II, XII.

[This description of the plane and axis of the pelvic brim is rather vague. Smellie clearly recognised the fact of the oblique direction of the brim, but does not seem to have been aware of the full degree of this obliquity, nor to appreciate how directly it bears on the mechanism of parturition, and on certain obstetric manipulations. In this particular he is no worse than many of the eminent writers who succeeded him. The great obliquity of the brim, with reference to the horizon, is a most important circumstance, and therefore deserves special mention when considering the obstetric properties of the pelvis. The angle which the plane of the brim forms with the horizon (in the erect position of body) is about 60°; consequently its axis would be described by a right line drawn from

the tip of the sacrum to a little below the umbilicus. The plane of the outlet may be said to vary in some degree, according to the condition of the perineum and contiguous soft parts; but in a general way it may be represented by a line drawn from the second bone of the sacrum through the centre of the pubic arch; and in proportion to the resistance of the perineum this line will approach nearer to the symphysis pubis.]

Sect. 3.—*Measurements of the Pelvis.*

In the consideration of the pelvis, three circumstances are to be principally regarded and remembered; namely, the width, the depth, and form of the cavity on the inside.

1. The extent of the brim from the back to the fore part, commonly amounts to four inches and one quarter; and from one side to the other, the distance is five inches and a quarter: so that this difference of an inch in the different axes (*or diameters*) ought to be carefully attended to in the practice of midwifery. (See Tab. I.) But the width of the lower part of the pelvis is the reverse of this calculation, when the os coccygis is pressed backward by the head of the child: because, in that case, the distance between the coccyx and the lower part of the os pubis is near five inches; whereas the inferior and posterior parts of one os ischium are no more than four inches and a quarter from some (*same?*) parts of the other. Indeed, the width of the lower part of the pelvis is naturally the same in both diameters; so that this difference is occasioned by the yielding of the coccyx in the birth. Yet, though the motion of the os coccygis backward should make little odds to the width, the back part of the pelvis, when measured from the brim, being three times deeper than at the pubes on the fore part, answers the same purpose as if it were wider from the back to the fore part, than from side to side; because, by the time that the child's head is come down to the lower part of the pelvis, and the forehead

turned back to the concavity formed by the os sacrum and coccygis, part of the os occipitis is come out below the pubes. See Tab. II, XIV, XVII.

2. The depth of the pelvis, from the upper part of the sacrum, where it is articulated with the last vertebra of the loins to the lower end of the coccyx, is about five inches in a straight line; but when this appendix is stretched outward and backward, the distance will be more.

The depth from the sides to the brim towards its fore part, to the lower parts of the ischia, is four inches; and from the upper to the lower parts of the ossa pubis, where they join, the distance is no more than two inches. So that, in the dimensions of the pelvis, the side is twice and the back part three times the depth of the fore part.

3. Nor is the form and shape of the inside of the pelvis to be neglected by the practitioners of midwifery.

The sacrum and coccyx being convex on the outside, exhibit a concave figure on the inside: the curve being increased towards the lower end, so as that, from the extremity of the coccyx to the middle of the sacrum, the sweep nearly represents a semicircle; and from thence the bone slopes upward and forward.

From the upper part of the brim on each side (but nearer the fore than the back part) to the lower parts of the ischia, the descent is perpendicular: and the opening on each side, betwixt the lower parts of the sacrum and the posterior part of each ischium, is about three inches deep, and two and a half in width. The upper part of this vacuity on each side gives passage and lodgment to a muscle, vessels, nerves, &c. At its lower part, the coccygæus muscle and ligament above mentioned are stretched across from bone to bone; and this ligament is on the outside strengthened with another strong expansion, rising from the tuberosity of the ischium, and fixed into the edge of the sacrum and coccyx. All these parts yield and

stretch, forming a concave equal to that of the sacrum, when the fore or hind head of the child is pushed down at the side and back part of the pelvis.

From the upper to the under parts of the ossa pubis, which form the anterior angle of the pelvis, the descent is almost perpendicular, or rather inclining a little backwards; so that the inside of the basin is bent into a concave behind, and descends in almost a straight line before; while the ilia slope outwards as they rise, and the vertebræ of the loins turn backwards making an obtuse angle with the sacrum.

On the whole, it is of the utmost consequence to know, that the brim of the pelvis is wider from side to side than from the back to the fore part; but that, at the under part of the basin, the dimensions are the reverse of this proportion; and that the back part, in point of depth, is to the fore part as three to one, and to the sides as three to two.

Though those dimensions obtain in a well-shaped pelvis, they sometimes vary in different women; and the reason of this remark will be more fully explained, when we treat of the method of delivery, in the different kinds of labours. See Tab. I, II.

[Strange to say, Smellie takes no aeeount of the oblique diameters of the pelvis. His observations apply to the dry pelvis denuded of soft parts. Had he earefully examined the measurements of the pelvis in the reeent subjeet, he would probably have reeognised the fact of the oblique being somewhat greater than the transverse or bis-iliae diameter; and as he clearly saw—and was the first to do so—that there was a determinate relation between the positions of the child's head and the pelvis throughout the whole proeess of parturition from first to last, he might probably have been led to antieipate the discovery of Saxtorph and Solayrès, viz. that the head when entering the pelvic brim occupies one or other of the oblique diameters. This is the normal, regular course, and to the above obstetrieians belongs the merit of pointing out that it is so; but Smellie was aware, as I shall show further on, that the head

occasionally at all events, presented at the inlet with its longitudinal diameter placed obliquely. See also p. 92.]

Sect. 4.—*Of a distorted Pelvis.*

The pelvis in decrepit women is not always distorted; because the distortion of the spine, in many women, does not happen till the age of eight, ten, twelve, or fourteen; when, being tall and slender, it is occasioned by mismanagement in their dress, lying too much on one side, and other accidents; without having any effect upon the pelvis, the shape of which is by that time ascertained.

But most of those who have been ricketty in their infancy, whether they continue little and deformed, or, recovering of that disease, grow up to be tall stately women, are commonly narrow and distorted in the pelvis, and consequently subject to tedious and difficult labours: for, as the pelvis is more or less distorted, the labour is more or less dangerous and difficult.

In ricketty children, the bones are soft and flexible; and as they cannot run about and exercise themselves like those of a more hardy make, the pelvis, in sitting upon stools or the nurse's knees, is, by the weight of the head and body, often bent and distorted in the following manner:

The coccyx is pressed inwards towards the middle of the cavity of the pelvis; the adjacent or lower part of the sacrum is forced outwards; while the upper part of the same bone is turned forward with the last vertebra of the loins, approaching too near to the upper part of the pubes. So that the distance, in some women, from the back to the fore part of the brim, is not above three inches; in others, no more than two; and sometimes, though rarely, not above one inch and a half. See Collect. I. Tab. III, XXVII, XXVIII.

In others, the lower vertebra of the loins with the upper end of the sacrum, jet inwards and to one side: the ossa pubis, instead of being inwardly concave, are sometimes convex; and the lower part of each ischium so near to one another, that the distance, instead of four inches and one quarter, will not amount to more than three, and in some cases not so much.

Sometimes the vertebræ that compose the sacrum ride one another, and form a large protuberance in that part which ought to be concave; but the most common circumstance of distortion is the jetting forward of the last vertebra of the loins with the upper end of the sacrum, forming a more acute angle with the spine; and in this part of the passage the head most commonly sticks. See Cases No. 189, 190, 191, 192.

[Smellie has rightly observed that a crooked spine does not always indicate a contracted pelvis, for very often we may have a normal pelvis along with the spinal deformity; but certainly it should always excite a suspicion, and cause us to make particular exploration. The information our author gives on the subject of pelvic distortion is very meagre; he does nothing more than notice in the briefest manner the more common distortions met with at the time of labour and arising from rickets. Clinically it is of small moment what causes the deformity; its timely recognition, and its degree or amount, are the all important points for our consideration; and next comes the particular mode of treatment which the deformity calls for. The pelvis deformed by malacosteon generally presents characters which distinguish it from the ricketty pelvis, but are of no importance in a purely clinical point of view.

Preternatural smallness of the pelvis, all its diameters being equally reduced, is the result of an arrest of development, or of rickets in early life. This is the *pelvis æquabiliter justo minor* of Naegèlé, who was the first to describe it. The amount of resistance which such a pelvis offers to delivery is much greater than one is led to suppose from ordinary examination at the beginning of labour.

Another form of faulty pelvis, not actually diseased, is where it

approximates in its characters to those of the male pelvis. Dr. Murphy has drawn attention to this species of faulty pelvis, and I can corroborate the remarks he has made respecting it. He writes:—"The triangular shape of the brim is not generally an impediment; because, although the transverse measurement is diminished, the oblique is sufficiently wide, and the head will usually pass into the cavity. But here all the difficulties seem to centre. Anteriorly the symphysis pubis is narrower and more unyielding; even a deposition of bone is sometimes found behind it, which may be extremely dangerous if the intervening soft parts be pressed against it by the head. Posteriorly the promontory of the sacrum offers no opposition; but the sacrum itself being straighter, there is less facility in the head performing the lateral rotation which has been already described. This difficulty is still more increased by the convergence of the ischio-pubic rami; the head is obliged to descend much lower in the pelvic cavity before it can escape under the pubic arch, and it is prevented from doing so in consequence of the space being so much lessened by its funnel shape. In addition to this, the tuberosities and spines of the ischia are more ossified; the former thicker and rougher, the latter larger and more projecting. Thus, as the head advances, its passage becomes more and more impeded, until it is ultimately arrested, perhaps close to the outlet." ('Lectures on Midwifery,' 2nd edit., p. 154.)

The obliquely ovate pelvis is a comparatively rare form of deviation, first described by Professor Naegèlé, of Heidelburg. It is capable of presenting great difficulties to the birth of the child. It is not at all so recognisable as those other kinds of deformity where the conjugate diameter is materially shortened; indeed, by some writers its diagnosis is said to be most difficult. Professor Sinclair thus describes the marks by which he was led to the diagnosis of a case occurring in the Dublin Lying-in Hospital:—"I could not reach the sacro-vertebral angle, which indicated that there was no appreciable narrowing of the antero-posterior diameter of the inlet, and then I had the following points to guide me in arriving at the particular conclusion I did:—*The extreme approximation of the right ischiatic spine towards* its corresponding side of the sacrum, and the great narrowing of the sciatic notch of the same side, as perceived by the fingers when placed in that region; whereas this peculiar *narrowing of the notch, and vicinity of the*

sciatic spine to the sacrum, did not exist to anything near the same extent on the left side; but, besides this, when the fingers were made to sweep along the right wall of the pelvis, a considerable and unmistakable flattening was found in connection with that side, which in no degree was felt in connection with the other lateral wall, the latter giving the sense of its natural curvature to the touch. These were the chief and most prominent features in the examination which guided me in forming my opinion." ('Dub. Med. Jour.,' August, 1855, p. 86.)

The transversely contracted pelvis (of Robert), or the doubly oblique pelvis as it is sometimes, but rather inaptly, called, has for its characteristic conditions anchylosis of both sacro-iliac joints, with remarkable flattening of the sides of the pelvis. This, I believe, is an extremely rare form of contracted pelvis.

Besides these morbid states of the pelvis, experience abundantly shows that its cavity may be encroached upon by tumours of various kinds, such as exostosis, osteo-sarcoma, fibroid, &c., growing from the sacrum or os innominatum; badly united fractures also of this bone may materially abridge the pelvic capacity. Of this last rare occurrence I lately saw a remarkable example in the Dublin Lying-in Hospital, under the care of the then master, Dr. George Johnston. It was the woman's second pregnancy, the first child having been extracted with great difficulty by the perforator and crotchet. Externally the last lumbar vertebra was unusually prominent; below this the sacrum appeared quite flat down to the very coccyx. Internally the anterior surface of the sacrum presented a well-marked convexity, causing very considerable abridgment of the antero-posterior diameter of the outlet and lower part of the pelvic cavity. The former was reduced to about two inches and a half. The history this woman gave of herself was, that when about thirteen or fourteen years of age she got a very severe fall from out of a swing, and came heavily to the ground, alighting on the buttocks. In consequence of this fall she was confined to bed for twelve months, and had for some time a slightly paralysed condition of the lower extremities, which has, however, long since disappeared. On the present occasion Dr. Johnston induced labour, and she was delivered by the natural efforts, but the fœtus appeared to have a development of only about six months, and did not survive its birth.]

Sect. 5.—*Mechanism of Parturition.*

The pelvis in women is wider than in men, the ilia spreading more outward, in order to sustain and allow free space for the stretching of the uterus; the sacrum is more concave; and the processes of the ossa pubis, at their junction with the ischia, are not so near to one another.

In order to demonstrate the advantage of knowing the wideness, depth, and figure of the inside of a well-formed pelvis, it will be necessary to ascertain the dimensions of the head of the child, and the manner of its passage in a natural birth.

The heads of those children that have passed easily through a large pelvis, as well as of those that have been brought by the feet, without having suffered any alteration in point of shape by the uncommon circumstances of the labour; I say, such heads are commonly about an inch narrower from ear to ear, than from the forehead to the under part of the hind-head.

That part of the head which presents, is not the fontanel (as was formerly supposed), but the space between the fontanel and where the lambdoidal crosses the end of the sagittal suture, and the hair of the scalp diverges or goes off on all sides: for, in most laborious cases, when the head is squeezed along with great force, we find it pressed into a very long oblong form, the longest axis of which extends from the face to the vertex. From whence it appears, that the crown or vertex is the first part that is pressed down, because, in the general pressure, the bones at that part of the skull make the least resistance, and the face is always turned upward. See Tab. XXVII, XXVIII.

[Some readers are a little puzzled to know exactly what Smellie means in this passage by the face being "turned upward." But I think a reference to the plates clearly shows what he intends to convey, viz. that the face is looking somewhat upwards and in the

direction of the abdomen, in consequence of the extreme flexion of the head on its biparietal or bi-mastoid diameter.]

Sometimes, indeed, this lengthening or protuberance is found at a little distance from the vertex backward or forward, or on either side; and sometimes (though very seldom) the fontanel or fore-head presents; in which case they protuberate, while the vertex is pressed and remains quite flat. But these two instances do not occur more than once in fifty or a hundred cases that are laborious.

Now, supposing the vertex is that part of the head which presents itself to the touch in the progress of its descent, *the fontanel is commonly upwards at one side of the pelvis, and is distinguished by the fontanel where the coronal suture crosses the sagittal, the frontal bones at that part having more acute angles than the parietal;* and when the hind-head comes down to the os ischium of the contrary side, one may feel the lambdoidal suture where it crosses the head of the sagittal, and, unless the scalp be very much swelled, distinguish the occiput at its junction with the parietal bones by the angle, which is more obtuse than those that are formed at that part of the skull: besides, in this position, the ear of the child may be easily perceived at the os pubis.

[The above sentence which I have caused to be printed in italics is somewhat obscure; nevertheless, it stands so in nearly all the copies I have seen of editions subsequent to the second. In the first and second editions the sentence runs thus:—"The fontanelle is commonly turned more upwards and to one side of the pelvis." On referring to Smellie's own interleaved and annotated private copy of the first edition (which I have by me), I find the MS. correction of the above passage to be as follows:—"The fontanelle is commonly upwards at one side of the pelvis, and is distinguished by the sagittal suture crossing the coronal, likewise the angles of the frontal bones are more acute than the parietal." After all, these are, comparatively speaking, unimportant verbal differences, as the sense of the passage is, I think, plain enough.]

As the head is forced farther along, the hind-head rises gradually into the open space below the ossa pubis, which is two inches higher than the ischium, while at the same time the fore-head turns into the hollow of the sacrum.

This, therefore, is the manner of its progression. When the head first presents itself at the brim of the pelvis, the fore-head is to one side, and the hind-head to the other, *and sometimes it is placed diagonal in the cavity:* thus the widest part of the head is turned to the widest part of the pelvis, and the narrow part of the head from ear to ear applied to the narrow part of the pelvis, between the pubes and the sacrum. See Tab. XIII, XVI.

[The above line has been put in italics, as the statement therein contained possesses a special interest for us, apart from its intrinsic importance. Further on, at page 95, I have dwelt at some length on the particular point to which it relates.]

The head, being squeezed along, the vertex descends to the lower part of the ischium, where the pelvis becoming narrower at the sides, the wide part of the head can proceed no farther in the same line of direction: but the ischium being much lower than the os pubis, the hind-head is forced in below this last bone, where there is least resistance. The fore-head then turns into the hollow at the lower end of the sacrum, and now again the narrow part of the head is turned to the narrow part of the pelvis. (See Tab. XIV, XVII.) The os pubis being only two inches deep, the vertex and hind-head rise upward from below it; the fore-head presses back the coccyx; and the head, rising upward by degrees, comes out with a half-round turn from below the share-bone: the wide part of the head being now betwixt the os pubis and the coccyx, which, being pushed backwards, opens the widest space below, and allows the fore-head to rise up also with a half-round turn from the under part of the os externum. See Tab. XVIII, XIX.

From these particulars, any person will perceive the

advantage of remembering that the pelvis at the brim is wider from side to side, than from the fore to the back part, while below it is the reverse in point of dimension; that the pelvis is much shallower at the os pubis than at the sides and back part; and that the saerum and coccyx form a large concave in their descent, whereas that of the os pubis is perpendieular. Neither is it less necessary to consider the form of the head, as above described; for the knowledge of these things will convey a distinct idea of the manner in which the head is to be brought along in laborious cases; on what occasions the use of the forceps may be necessary; and when the method must be varied, as the form of the head or pelvis may ehance to vary from our description.

Although the position of the head, in natural and laborious births, is commonly such as we have observed, it is not always the same, but sometimes differs according to the different figures of the pelvis and head, and the posture of the child *in utero*. For when the waters are in small quantity, or the membranes broke, so that the body of the child is close confined by the womb, if the fore parts are towards the belly of the mother, that position may hinder the head from making the proper turns as it is pushed down, and the forehead may be forced towards the groin or pubes. (See Tab. XX, XXI.) Sometimes, even in a well-formed pelvis, if the fontanel presents itself with the fore-head to one side of the brim, and the hind-head to the other, when the head is forced down by the increasing pains, there will be less resistanee at the vertex than at any other part; consequently the diameter from the fore to the hind-head will be lessened; and this last, by aceommodating itself to the cireumstances of the pressure, be first squeezed down, and at length come forward in the natural way: or, should the ear present itself, the vertex will be forced down in the same manner. But if the forehead be

nearer than the vertex to the middle of the brim of the pelvis, every pain will force it farther down, and when delivered it will rise in form of an obtuse cone or sugar-loaf; and in that case the crown of the head will be altogether flat. But if, instead of the vertex or forehead, the fontanel should first appear, the space from the fore-head to the crown will then rise in form of a sow's back; and in all these cases, the head is brought along with greater difficulty than in those where the vertex is first produced: and, in all laborious cases, the vertex comes down, and is lengthened in form of a sugar-loaf, nine-and-forty times in fifty instances. When the forehead presents, the face is sometimes pressed forwards. (See Tab. XXII.) If the pelvis be as wide from the back to the fore part as from side to side, (though this seldom happens), the crown may be pushed down at the pubes, and the fore-head afterwards squeezed into the hollow of the sacrum, without making the foregoing turns. If the belly of the child is to the fore part of the uterus, the vertex may be towards the sacrum, and the fore-head to the pubes or groin: so that all these uncommon positions are attended with difficulty.

[Had Smellie made no other contribution to midwifery than what is contained in this chapter, he would still have placed accoucheurs under a perpetual obligation. Notwithstanding the accessions that have since been made to our knowledge of this subject, his brief, clear, and simple account of the passage of the head through the pelvis may be studied with interest and advantage. In it he gives a faithful outline of the positions and movements of the head in its course through the true pelvis, but it remained for future observers, especially Saxtorph, Solayrès and Naegèlé, to fill this up and render it a complete account.

Little of what Smellie described and laid down has been found wrong, and not very much has been added to it, except in regard to details, and to the causation of the various movements of the head *in partu*. His greatest error, perhaps, was the assertion that the fœtal head as a rule enters the brim in its transverse or bis-iliac

diameter, the forehead being at one side and the occiput at the other. His statement that the head engages in the long diameter of the brim was correct, but he erred in supposing this to be the transverse diameter. He was convinced the head should engage in the pelvis with its longitudinal or occipito-frontal measurement coincident with the long diameter of the pelvic inlet, which he thought was the bis-iliac one; and for once, and once only I believe, he seems to have been swayed by theory, and to have allowed his judgment upon a matter of fact and observation to have been warped. This seems the most probable way to account for his misapprehending the point in question, and it is partially borne out by the various passages in which he describes the transverse diameter of the brim being the longest; and also by his silence with regard to the oblique measurements of the same opening. His candour in recording the results of his observations, even where it conflicts with his theory, is very remarkable and quite characteristic of the man. And hence we find he did not lay it down as an inflexible rule that the head engaged transversely at the brim, for he admits that "when the head first presents itself at the brim of the pelvis, ... sometimes it is placed diagonal in the cavity," which, I conceive, can only mean that it is placed in the oblique diameter. Again, further on he observes, "If the pelvis be as wide from the back to the fore part as from side to side (though this seldom happens), the crown may be pushed down at the pubes, and the fore-head afterwards squeezed into the hollow of the sacrum without making the foregoing turns."

If I interpret his views aright, we may safely assert that Smellie anticipated Ritgen, Flammant, Ramsbotham, and Schroeder, in a general recognition of the fact that the head may enter the pelvis with its longitudinal diameter coincident with the transverse, oblique, or conjugate diameter of the brim. Dr. Leishman, though in general a warm admirer of his, is of opinion that the observation of Smellie as to the head "being sometimes placed diagonal" "cannot be taken as meaning much; for, although the general tenor of his description of the process is to the effect that the head does not quit the transverse position until it has descended into the cavity so far as to allow the face to turn into the hollow of the sacrum, yet it is probable that in recording this observation with that honesty which is so characteristic of him, even while citing facts which tend to overthrow his own theories, he would not probably see more in it than this—that the change had partly taken place a little earlier than

usual; for it is clear that if the head passes from the transverse to the conjugate diameter, it must at some point assume a diagonal direction. A careful perusal of this most admirable work puts it beyond a doubt that Smellie was much nearer the truth than many who came after him." ('An Essay, Historical and Critical, on the Mechanism of Parturition,' page 24.)

Great though my respect is for this talented and learned author—whose essay on the mechanism of parturition I cannot too highly praise—yet on the point before us I think he hardly does justice to Smellie; for, in the passage, p. 92, where he (Smellie) says "the head is sometimes placed diagonal," &c., he is speaking, as the first clause expressly states, of the relations of the head when it "first presents itself at the brim of the pelvis."

Although he does not distinctly state so, yet one is led to suppose Smellie thought that the rotation of the head on its vertical axis took place when the vertex was near the floor of the pelvis and had begun to experience the resistance of the ischiatic spines; and such seems to be the general opinion at the present day. His description further leads to the inference that the occipito-frontal diameter of the head becomes fairly opposed to the long or antero-posterior diameter of the outlet, when passing through it. As a general expression of what does take place this may be received; it *was* the nearest approach to the truth, but was not the exact truth, though quite sufficient for all practical purposes. It is now held by very high authorities that the head when clearing the detroitus inclines somewhat to the obliquc diameter of the pelvic cavity, which diameter it had previously occupied; and, secondly, that it has a slight degree of rotation on its occipito-frontal diameter, in consequence of which the parietal eminence which lies next the pubes is somewhat in advance of the other with regard to the plane of the outlet. From repeated observation I have satisfied myself of the correctness of both these statements in the majority of cases; at the same time I feel they are no more than the finishing touches to the great doctrine enunciated by Smellie.

CHAPTER II.

OF THE EXTERNAL AND INTERNAL PARTS OF GENERATION PROPER TO WOMEN.

SECT. 1.—*The External Parts and Vagina.*

THE mons Veneris is situated at the upper part of the pubes, from which also begin the labia pudendi, stretching down as far as the lower edge, where the frænum labiorum or fourchette is formed.

The clitoris with its præputium is found between the labia, on the middle and fore part of the pubes; and from the lower part of the clitoris, the nymphæ rising, spread outwards and downwards to the sides of the os externum, forming a kind of sulcus or furrow, called the fossa magna or navicularis, for the direction of the penis in coition, or the finger in touching, into the vagina. See Cases No. 4, 5, 6, 7, 8, 9.

The meatus urinarius is immediately below the under edge of the symphysis of the ossa pubis, and at the upper part of the os externum, which is the orifice of the vagina, situated immediately below the said bones of the pubes: the lower edge of which bones is equal to the lower edge of the frænum or fourchette, which bounds the inferior part of the fossa magna and os externum, restraining it as if with a bridle.

The perinæum extends from this border to the anus, being about one inch or one and an half in length: the wrinkled part of the anus is about three quarters of an inch in diameter; from thence to the coccyx the distance

is about two inches: so that the whole extent from the fourchette to this bone amounts to about four inches, or four and a quarter.

What remains of the lower part of the pelvis is covered and filled up with the integuments, adipose membrane, and the muscles called levatores ani; while within these are contained the muscles belonging to the clitoris, mouth of the bladder, os externum, and anus. See Tab. IV.

In young children, there is a thin membrane called the hymen, extended over the lower part of the os externum, representing the figure of a crescent; the concave and open side being turned towards the meatus urinarius. In some, the middle of this concave is attached to the lower part of the meatus, forming two small openings; nay, in some adults this membrane has entirely shut up the entrance of the vagina, so that they have been altogether imperforated; but when broke, it recedes, and forms the carunculæ myrtiformes. See Cases No. 6, 7, 8.

On each side of the meatus urinarius are two small lacunæ or openings, the tubes of which, ending in a kind of sacculus, come from the prostate gland: from these a thin fluid is ejected in time of copulation, and that from some women with considerable force; and sometimes, though seldom, to the quantity of several drachms.

The urethra in women is about one inch and a half in length. The vagina is formed of a strong thick membrane, of a spongy texture, more contracted in virgins than in married women. When stretched to its full extent, it may be about five, six, or seven inches long and two in width, according to the difference of nature in different women: but, when the uterus hangs down in the vagina, the length will not be more than two or three inches; and it may be stretched with the finger to the wideness of three or four. The inside of it, in young women, is full of rugæ, folds or wrinkles, which are partly obliterated in those who have

borne children. The upper end of the vagina is joined to the circumference of the lips of the os uteri, which resemble the mouth of a puppy or tench; and a thin expansion of this membrane, being reflected inwards, covers the exterior part of these lips, which in virgins are smooth and of an oval form. It is also continued along the inside of the uterus, constituting the internal membrane of the neck and fundus, which is likewise full of plicæ, especially in young subjects. See Tab. V, VI.

As to the different names of those parts, the book of Schurigius, published at Dresden in the year 1729, may be consulted. The entry of the vagina is commonly called the *sphincter vaginæ*, and the mouth of the womb is often distinguished by the appellation of *os tincæ:* but, as the mention of these parts will frequently occur in the course of this treatise, I shall, in order to avoid confusion or mistake, call the first os externum, and the other os internum, through the whole book.

Sect. 2.—*Of the Uterus.*

The uterus is about three inches long from the os internum to the upper part of the fundus, and one inch in thickness from the fore to the back part. It is divided into the neck and fundus; the length of the neck being an inch and three quarters, while that of the fundus is one inch and one quarter. The width of the uterus at the neck is about one inch, but at the fundus twice as much. The uterus is smaller in young women.

The outside shape of the uterus in some measure resembles a flattened cucurbit, or that kind of pear which hath a long neck.

The canal or entrance from the os internum to the cavity of the fundus uteri, will admit a common director; being

a little wider in the middle, and more contracted at the upper end.

The cavity of the fundus, is in point of figure something between an oval and triangle : one of the angles commencing at the upper end of the foresaid canal, and the other two expanding the sides of the fundus, from which arise the Fallopian tubes. These tubes are about three inches long ; and so narrow at their entrance from the uterus, as scarcely to admit a hog's bristle ; but the cavity of each turns gradually wider, and ends in an open mouth or sphincter, from the brim of which is expanded the fimbria or morsus diaboli, that generally bears the likeness of jagged leaves, and in some resembles a hand with membranous fingers, which is supposed to grasp the ovum when ripe and ready to drop from the ovarium.

The uterus is formed first of the inside membrane that rises from the vagina, and lines all the interior part of the womb : immediately above this coat is the thick substance of the uterus, composed of a plexus of arteries, lymphatics, veins, and nerves ; and the vessels on its surface, when injected, seem to run in contorted lines. It appears to be of the same glandular texture (though not so compact) as that of the breasts, without any muscular fibres, except such as compose the coats of the vessels : neither is there any necessity for that muscle which Ruysch pretended to discover at the fundus, for the convenience of forcing off the placenta ; because this cake as frequently adheres to other parts of the womb as to the fundus.

The substance of the uterus appears more compact and pale than that of muscles ; or if it be muscular, at least the fibres are more close, and more intricately disposed, than in other muscular parts. The blood-vessels of the womb, in the virgin or unimpregnated state, are very small, except just at their approach to its sides, at the roots of the ligamenta lata. But, as soon almost as they enter its

substance, they are dispersed into such numbers of smaller branches through the whole, that, when it is cut, we can observe but few, and those very small, orifices, much less any cavities that deserve the name of sinuses. Indeed, when this part is minutely injected, it seems to be almost nothing but a mass of vessels; a circumstance common to it with other parts of the body. And anatomists are agreed, that the greater number of vessels visible in such nice injections, are those through which the serum or lymph of the blood circulates in the living body; whence the *error loci* in an ophthalmia is imitated by subtile injections of coloured matter into the arteries of the dead subject. See Tab. V.

When the uterus stretches in time of gestation, the vessels are proportionably dilated by an increase of the fluid they contain: so that, at the time of delivery, some of them are capacious enough to admit the end of the little finger. Yet the substance of the womb, for the most part, instead of growing thinner, as Mauriceau alleges, or thicker, according to Deventer, continues of its natural thickness during the whole term of pregnancy: and this equality is maintained by the gradual distension of the vessels that enter into its composition. In time of labour, indeed, as the waters are discharged, the uterus contracts itself and grows thicker; and the resistance ceasing at the delivery of the child and after-birth, it becomes smaller and smaller, until it has nearly resumed its natural dimensions. See Collect. III. Tab. IX, XII.

For, as the uterus contracts itself after parturition, the arterial blood cannot flow into it in the same quantity as that with which the vessels are filled in their state of distension. The fluids are gradually emptied into the vena cava ascendens, but chiefly through the mouths of the vessels that open into the cavity of the womb; and the vessels themselves that were stretched, elongated, and

seemed to recede from one another, are also contracted by degrees, and that in such a direction as to reduce the uterus into the same shape and size which it bore before impregnation: nay, the fibres are again so compacted, that they, and even the vessels, are scarce discernible.

The vagina on its outside is covered with a thick adipose membrane: by means of which it is on the fore part attached to the lower part of the bladder, and on the back part to the lower end of the rectum and anus; and by the same means all these parts are connected with the peritonæum, or internal surface of the pelvis.

The uterus is contained in a duplicature of the peritonæum, which covers it everywhere above, and is connected with its substance by a very thin cellular membrane; as for the peritonæum in itself, it is a smooth membranous expansion, that covers all the inside of the abdomen, and gives external coats to all the viscera contained in that cavity. On the fore part it lines the muscles of the abdomen and diaphragma; backwards, it covers the abdominal viscera in general, the aorta and vena cava descendens, the kidneys, ureters, and spermatic vessels, the external and internal iliacs, the psoas and muscles that cover the inside of the ilium, whence it rises double, and forms the ligamenta lata, in which are contained the ovaria and Fallopian tubes. This duplicature, where it meets in the middle, envelops all the uterus, as before observed, and gives a covering to the round ligaments that rise from each side of the fundus uteri, and are inserted or lost about the upper and external part of the pubes and groin. The peritonæum is also reflected from the fore part of the uterus over the upper part of the bladder: and upon the back part of the uterus it descends even upon the vagina, from which it is again reflected upwards over the rectum. By these attachments, especially the broad and round ligaments, the uterus is kept between the vesica urinaria and rectum, loosely sus-

pended in the vagina, within two or three inches of the os externum; the epiploon and intestines occupy the upper and fore part of the pelvis, by which means the uterus is pressed downwards and backwards to the lower and concave part of the sacrum. (See Tab. V, fig. 2.) As the vesica urinaria fills and stretches with urine, the viscera are raised: but as the bladder is emptied, they return; and this is the reason that the os uteri is commonly felt backwards towards the os coccygis. Sometimes it is found tilted to one side; at other times forwards towards the pubes, and the fundus pressed low down on the back part. The os uteri is also higher or lower according as the ligaments are more or less lax or tense. In coition, the uterus yields three or four inches to the pressure of the penis, having a free motion upwards and downwards, so that the reciprocal oscillation, which is permitted by this contrivance, increases the mutual titillation and pleasure. See Tab. V.

The ligaments undergo no extraordinary extension in time of uterine gestation, because they sink down two inches with the uterus in an unimpregnated state; and when the fundus rises, they will be raised, at the same time, to the height of not only these two inches, but as much more, without being stretched in the least. Besides, as the uterus rises still upwards, the sides of it approach the ilia, from whence the broad ligaments take their origin; and this circumstance is equal to an acquisition of three inches more. So that, upon the whole, these ligaments seem to be very little stretched, even in the last month of pregnancy.

Sect. 3.—*Of the Ovaria, Vessels, Ligaments, and Fallopian Tubes.*

The ovaria are two small oval bodies, one of which is placed behind each Fallopian tube; supposed to be little more than a cluster of ova, whence they derive their present name: for, by ancient authors, they are mentioned by the appellation of *female testicles*. Each ovarium is about one inch in length, half as broad, and one quarter of an inch in thickness; more convex on the fore than on the back part, of a smooth surface, covered with the peritonæum. See Tab. V.

The blood-vessels are, first, the spermatic arteries and veins, which have nearly the same origin as those in men, are mostly distributed upon the ovaria and tubes, and at the upper part of the uterus communicate with the hypogastrics; from the branches of which the body of the womb is furnished. All these arteries anastomose, and are supposed to detach small ramifications that open into the cavity of the uterus. The veins are large, communicate one with another, with the hæmorrhoidals and vena portarum, and have no valves.

The ligamenta rotunda are two vascular ropes composed of veins and arteries inclosed in the duplicature of the ligamenta lata; seemingly arising from the crural artery and vein, from whence they are extended to the sides of the fundus uteri.

The nerves come from the intercostals, lumbares, and sacri; as described in Boerhaave's 'Institutes,' and Winslow's 'Anatomy.'

CHAPTER III.

SECT. I.—*Of the Catamenia and Fluor Albus, in an Unimpregnated State.*

THE uterus, according to some, and all the parts subservient to generation, arrive at full growth about the age of fifteen The vessels are then sufficiently dilated, and those that end in the cavity of the womb, so distended with blood, that their mouths are forced open, they empty themselves gradually, and for that time the plethora in the uterus and neighbouring parts is removed.

Several ingenious theories have been erected, to account for the flux of the menses; particularly by Doctors Friend, Simpson, and Astruc: the two last of whom, with many others, allege, that there are sinuses in the uterus, furnished with side vessels opening into its cavity; which sinuses are gradually stretched by the blood they receive from the arteries, until the fourth or beginning of the fifth week, when the lateral vessels are forced open, and the accumulated blood evacuated into the cavity of the womb. But, if this were the case, the same mechanism must prevail in other parts of the body, through which the like periodical discharge is made, when the uterus is obstructed; as from the nose, hairy scalp, lungs, stomach, mesenteric and hæmorrhoidal vessels, and even through the skin of the legs, and other parts of the body. Besides, such an accumulation in large sinuses, though the blood were not entirely stagnated, would produce a viscosity like that which obtains in the rheumatism and other inflammatory distempers.

Those who live in hot climates, are frequently visited with the menses at the age of twelve; and women who are kept warm, and live delicately, undergo this discharge earlier

than those who use a different regimen : and if the catamenia do not flow at the stated time, the patient is soon after seized with the chlorosis, unless some other evacuation happens in lieu of the menses.

They commonly cease to flow about the age of forty-five, except in those with whom they began at twelve, or in such as have borne a great many children ; in which case they cease about the age of two-and-forty, or sooner.

In young people, the momentum of the circulating fluid is greater than the resisting force of the solids ; so that the vessels continue to be gradually stretched, until, by their number, capacity, and length, this momentum is dissipated, so as to become no more than equal to the resistance. About this time the superplus of blood begins to be discharged, and thus the equilibrium is preserved till the age of forty-five ; when the fibres growing rigid, the incrementum is lessened, the evacuation is no longer necessary, nor has the blood force enough to make good its wonted passage into the cavity of the womb. In the same manner are produced the symptoms of old age.

The catamenia are, therefore, no more than a periodical discharge of that superplus of blood which is collected through the month, and, towards the crisis, attended with pains in the loins, breast, and head, more or less acute, according to the circumstances of the plethora ; all which complaints gradually vanish when the menses begin to appear.

This evacuation commonly continues till the fifth or sixth day, in some to the third only, and in others to the seventh : the quantity discharged being, according to Hippocrates, two *heminæ ;* equal, by the computation of some, to eighteen or twenty, and, in the opinion of others, to twenty-four, ounces : but this must certainly be a mistake ; for they rarely exceed four ounces, except when they flow in too great quantity.

Women that are delicately kept, and plentifully fed, have this discharge more frequently, and in greater quantity, than those who are inured to much exercise, or subject to copious perspiration: yet both these constitutions may be healthy, and ought not to be tampered with by prescriptions for altering the period or quantity of this evacuation. Indeed, if the flux be so frequent or immoderate as to exhaust the strength of the patient, it will be necessary to prescribe bleeding before the return of the period, rest, cooling and astringent medicines, not only taken internally, but likewise applied externally, and injected into the vagina. See Cases No. 10 et seq.

On the contrary, if they flow too seldom, in too small quantity, or do not appear at all, so that a dangerous plenitude ensues, the plethora must be lessened by plentiful bleeding and repeated purges, and the discharge solicited by warm baths, fumigation, and exercise. But if the patient has been long obstructed from a lentor, viscosity, and retarded motion of the fluids in the uterus and neighbouring parts, the fulness must be taken off by the above-mentioned evacuations, unless the constitution be already weakened: then everything that will gradually attenuate the fluids, and quicken their circulating force, ought to be administered; such as chalybeate and mercurial medicines, together with warm bitter and stomachic ingredients, assisted with proper diet and exercise, according to the prescriptions to be found in Hoffman, 'Friend's Emmenologia,' and Shaw's 'Practice of Physic.' See Collect. IV.

Of the Fluor Albus.

The inside membrane of the uterus, according to Astruc, is thick-set with small glands, which he calls the *colatura lactea*. These, in an unimpregnated uterus, separate a mucus that lubricates the cavity and canal of the neck, by

which means the sides are prevented from coalescing or growing together. The fluor albus is no other than this mucus discharged in too great quantity from the uterus, as well as from the vagina; and this excess, when it happens from plenitude, in those who feed plentifully without taking sufficient exercise, is often remedied by general evacuation, such as venæsection, emetics, cathartics, and a more abstemious diet, with a greater share of exercise than usual. But the cure is more difficult when the complaint is of a long standing, and proceeds from a bad habit, the constitution being weakened by the inordinate discharge. In this case, it will be necessary to use repeated emetics, gentle exercise, and all those medicines that contribute to strengthen a lax habit of body; or, if the distemper be cancerous, it must be palliated with anodynes. As to the form of prescription in all these cases, Hoffman may be consulted. See Collect. IV.

Sect. 2.—*Of Conception.*

The minutiæ or first principles of bodies being without the sphere of human comprehension, all that we know is by the observations of their effects; so that the *modus* of conception is altogether uncertain, especially in the human species, because opportunities of opening pregnant women so seldom occur.

Although the knowledge of this operation is not absolutely necessary for the practice of midwifery, an investigation of it may not only gratify the curious, but also promote farther inquiries; in the course of which, many material discoveries may be made, in the same manner as many valuable compositions in chemistry were found out in the last century by those who exercised themselves in search of the philosopher's stone.

From the time of Hippocrates to the sixteenth century,

it was generally believed that the embryo and secundines were formed by the mixture of the male and female semen in the uterus: but during the last hundred years, anatomy received great improvements by the frequent dissection of human bodies; and in some female subjects, the fœtus was found in one of the Fallopian tubes; in others, it was discovered in the abdomen, with the placenta adhering to the surface of the viscera. See Collect. V.

Malpighius and others, between the years 1650 and 1690, wrote expressly upon the incubation of eggs, their formation, and the gradual increase of oviparous animals. The great Harvey observed the progress of the viviparous kind, in a great number of different animals which he had opportunities of opening. De Graaf dissected near one hundred rabbits, and is very particular and accurate in the observations he had made. Ruysch, Aldes, Needham, Steno, Kerkringius, Swammerdam, Bartholine the son, and Drelincourt, employed themselves in the same inquiries; and, in consequence of their different remarks, a variety of theories have been erected: yet all of them have been subject to many objections; and even the following, though the most probable, is still very uncertain.

When the parts in women, subservient to generation, attain their acme or full growth, one or more of the ova being brought to maturity, that part of the peritonæum which covers the ovarium begins to stretch; the nervous fibres are accordingly affected, and contract themselves so as to bring the fimbria of the Fallopian tube in close contact with the ripe ovum: by which mechanism, this last is squeezed out of its nidus or husk into the cavity of the tube, through which it is conveyed into the uterus by a vermicular or peristaltic motion; and if it is not immediately impregnated with an animalcule of the male semen, must be dissolved and lost, because it is now detached from the vessels of the ovarium, and has no vis vitæ in itself.

The external coat of the ovum is the membrane *chorion;* one fourth part of which is the placenta, supposed to be the root by which it was formerly joined to the vessels of the ovarium; and the navel-string is no other than a continuation of the vessels belonging to this cake.

The chorion is on the inside lined with another membrane called *amnion;* and both are kept distended in a globular form by a clear serous fluid, or thin lymph.

As for the male semen, according to the observation of the celebrated Leeuwenhoek, it abounds with animalcula, that swim about in it like so many tadpoles; and these are larger and more vigorous the longer the semen hath remained in the vesiculæ seminales.

The parts of both male and female being thus brought to maturity, the following circumstances are supposed to happen in coition, especially in those embraces which immediately follow the evacuation of the menses. In the woman, the friction of the penis in the contracted vagina, the repeated pressure and shocks against the external parts, the alternate motion upwards and downwards of the uterus, with its appendages, the ovaria, Fallopian tubes,and round ligaments, produce a general titillation and turgency; in consequence of which, the nervous fibrils are convulsed, and a fluid ejected from the prostate or analogous glands, as well as from those of the uterus and Fallopian tubes. The fimbria belonging to one of which, now firmly grasps the ripened ovum, which at the same instant is impregnated with the male seed that in the orgasm of coition had been thrown into the uterus, and thence conveyed into the cavity of the tube by some absorbing or convulsive power. When the two matured principles are thus mingled, one of the animalcula insinuates itself into the ovum, and is joined with its belly to that ruptured part of it from which the navel-string is produced; or, entering one of the vessels, is protruded to the end of the funis, by which a circulation is

carried on from the embryo to the placenta and membranes. The ovum being impregnated is squeezed from its nidus or husk into the tube, by the contraction of the fimbria; and thus disengaged from its attachments to the ovarium, is endowed with a circulating force by the animalculum, which has a vis vitæ in itself: the vessels on the surface of the ovum being opened in consequence of its detachments from the ovarium, absorb the surrounding fluid which is secerned by the glands in the cavity of the tube and uterus, or forced into them by motion, heat, and rarefaction, and carried along the umbilical vein for the nourishment and increase of the impregnated mass.

Of the semen that is injected or absorbed into the uterus, part is mixed with the fluid secreted by the glands in the canal of the neck, which is blocked up with a sort of gluten formed by this mixture; so that the ovum is thereby prevented from sinking too far down, and being discharged.

This theory of conception, though very ingenious, and of all others the best supported with corroborating considerations, such as, that fœtuses and embryos have been actually found in the cavity of the tube and abdomen, without any marks of exclusion from the uterus; besides other presumptions that will be mentioned when we come to treat of the nutrition of the fœtus; I say, notwithstanding the plausibility of the scheme, it is attended with circumstances which are hitherto inexplicable; namely, the manner in which the animalculum gains admission into the ovum, either while it remains in the ovarium, sojourns in the tube, or is deposited in the fundus uteri; and the method by which the vessels of the navel-string are inoculated with those of the animalculum. Indeed, these points are so intricate, that every different theorist has started different opinions concerning them, some of which are rather jocular than instructive.

SECT. 3.—*Of the increase of the Uterus after Conception.*

It is supposed that the ovum swims in a fluid, which it absorbs so as to increase gradually in magnitude till it comes in contact with all the inner surfaces of the fundus; and this being distended in proportion to the augmentation of its contents, the upper part of the neck begins also to be stretched.

About the third month of gestation, the ovum in bigness equals a goose-egg; and then nearly one fourth of the neck at its upper part is distended equal with the fundus. At the fifth month, the fundus is increased to a much greater magnitude, and rises upwards to the middle space betwixt the upper part of the pubes and the navel; and at that period one half of the neck is extended. At the seventh month, the fundus reaches as high as the navel; at the eighth month it is advanced midway between the navel and scrobiculus cordis; and in the ninth month, is raised quite up to this last-mentioned part, the neck of the womb being altogether distended.

Now that the whole substance of the uterus is stretched, the neck and os internum, which were at first the strongest, become the weakest part of the womb, and the stretching force being still continued by the increase of the fœtus and secundines, which are extended by the inclosed waters in a globular form, the os uteri begins gradually to give way. In the beginning of its dilatation, the nervous fibres in this place being more sensible than any other part of the uterus, are irritated and yield an uneasy sensation; to alleviate which, the woman squeezes her uterus by contracting the abdominal muscles, and at the same time filling the lungs with air, by which the diaphragm is kept down; the pain being rather increased than abated by this straining, is communicated to all the neighbouring parts to which the

and inside of the thighs; and by this compression of the uterus the waters and membranes are squeezed against the os uteri, which is of consequence a little more opened.

The woman being unable to continue this effort for any length of time, from the violence of the pain it occasions, and the strength of the muscles being thereby a little exhausted and impaired, the contracting force abates; the tension of the os tincæ being taken off, it becomes more soft, and contracts a little; so that the nervous fibres are relaxed. This remission of pain the patient enjoys for some time, until the same increasing force renews the stretching pains, irritation, and something like a tenesmus at the os uteri; the compression of the womb again takes place, and the internal mouth is a little more dilated, either by the pressure of the waters and membranes, or, when the fluid is in small quantity, by the child's head being forced down by the contraction of the uterus, which in that case is in contact with the body of the fœtus.

In this manner the labour-pains begin, and continue to return periodically, growing stronger and more frequent until the os uteri is fully dilated, and the membranes are depressed and broke; so that the waters are discharged, the uterus contracts, and, with the assistance of the muscles, the child is forced along and delivered.

Although this account may be liable to objections, especially in those cases when the child is delivered before the full time, it nevertheless seems more probable than that hypothesis which imputes the labour-pains to the motion of the child calcitrating the uterus: for it frequently happens that the woman never feels the child stir during the whole time of labour; and dead children are delivered as easily as those that come alive, except when the birth is retarded by the body's being swelled to an extraordinary size.

[The absurd notion that the birth of a dead fœtus involved more pain and exertion to the mother than the birth of a living one, uni-

versally obtained among the ancients, and was a natural inference from the doctrine that delivery was accomplished mainly by the efforts of the child itself. Long after the latter had been exploded, the erroneous idea to which it originally gave rise, continued, and was widely prevalent even among medical men, in the early part of Smellie's career. How utterly he rejected it, however, is manifest from the text.]

Sect. 4.—*Of the Magnitude, Weight, and different Appellations given to the Ovum and Child.*

When the ovum descends into the uterus, it is supposed to be about the size of a poppy-seed, and in the third month augmented to the bigness of a goose egg. Ten days after conception, the child (according to some authors) weighs half a grain; at thirty days, is increased to the weight of twenty-two grains; at three months, weighs betwixt two and three ounces; and at nine months, from ten to twelve, and sometimes sixteen, pounds: by which calculation it would appear that the progress of the fœtus is quickest in the beginning of its growth; for from the tenth to the thirtieth day (according to this supposition) it increases to three and forty times its weight. All these calculations are uncertain.

The conception is called an *embryo*, until all the parts are distinctly formed, generally in the third month; and from that period to delivery is distinguished by the appellation of *fœtus*.

[It is only of late years that careful attention has been paid to the weight and dimensions of the fœtus. Joseph Clarke (of Dublin), Heeker, Matthews Duncan, Storer, and others, have published their observations on these points; and as a further contribution to the same subject, I subjoin the general results of a series of observations which I made in the Dublin Lying-in Hospital, in the years 1855 and 1856, and which are now for the first time committed to print. These averages were computed, at my request, by Dr. Henry Halahan,

and every confidence may be placed in their correctness. I regret that none of these tables were compiled with reference to the ages of the mothers, an element which Dr. Matthews Duncan has shown to exercise a greater influence upon the development of the child than either primaparity or multiparity. If of no other value, these figures will assist in forming data for the solution of the question of how far race or country have any influence upon fœtal development. Twin births were purposely excluded from these tables.

I.—Of 1233 mature children of *both sexes* and of *first and subsequent labours*, the average *weight* at birth was 7 lbs. 3 oz. 340 grs.; and the average *weight* of same children on the *eighth* day was 7 lbs. 2 oz. 16 grs. The average *length* of these children at birth was 20 inches.

II.—Of 652 mature *male* children, *first and subsequent* births, the average *weight* at birth was 7 lbs. 6 oz. 41 grs., the extremes being 11 lbs. 12 oz. and 4 lbs. 8 oz. The average weight of same children on eighth day was 7 lbs. 4 oz. 269 grs.

I may just remark here that there is preserved in the museum of the Dublin Lying-in Hospital the cast of a female child which weighed 14 lbs. at birth. It occurred, I believe, in the mastership of Dr. Evory Kennedy, and no history is preserved of the case beyond the above simple fact. The apparently largest child born during my Mastership (1854 to 1861) was twelve pounds avoirdupois. It was a boy, and was dead born, the mother, a multipara, having been some days in labour before admission.

III.—Of 581 mature *female* children, *first and subsequent* births, the average *weight* at birth was 7 lbs. 1 oz. 79 grs., the extremes being 10 lbs. 1 oz. and 4 lbs. 7 oz., and the average *weight* of same children upon the *eighth* day was 6 lbs. 14 oz. 426 grs.

IV.—Of 515 mature *male* children, *first and subsequent* births, the average *length* at birth was $19\frac{7}{8}$ inches, the extremes being 23 inches and 17 inches.

V.—Of 442 mature *female* children, of *first and subsequent* labours, the average *length* of the body at birth was $19\frac{1}{2}$ inches, the greatest length being $22\frac{1}{4}$ inches and $16\frac{1}{4}$ inches.

VI.—Of 389 mature children of *both sexes* and of *first* labours only, the average *weight* at birth was 6 lbs. 15 oz. 283 grs., and on the eighth day it was 6 lbs. 13 oz. 291 grs.

VII.—Of 218 mature *male* children, of *first* labours, the average *weight* at birth was 7 lbs. 1 oz. 376 grs., the extremes being 9 lbs.

13 oz., and 5 lbs.; and on the eighth day it was 6 lbs. 15 oz. 200 grs.

VIII.—Of 171 mature *female* children, of *first* labours, the average *weight* at birth was 6 lbs. 12 oz. 110 grs., the extremes being 8 lbs. 12 oz., and 4 lbs. 7 oz.; and on the eighth day it was 6 lbs. 11 oz. 120 grs.

IX.—Of 301 mature children of *both* sexes, and of *first* labours only, the average *length* at birth was $19\frac{5}{8}$ inches.

X.—Of 844 mature children, *male and female*, of *subsequent* labours, the average *weight* at birth was 7 lbs. 5 oz. 300 grs., and on the eighth day 7 lbs. 3 oz. 394 grs. The average *length* of these children when born was $19\frac{6}{8}$ inches.

XI.—Of 434 mature *male* children, of *subsequent* labours, the average *weight* at birth was 7 lbs. 8 oz. 96 grs., the extremes being 11 lbs. 12 oz., and 4 lbs. 8 oz.; and on the eighth day it was 7 lbs. 2 oz. 287 grs. The average *length* at birth of these children was 20 inches, the extremes being 23 inches and 17 inches.

XII.—Of 410 mature *female* children, of *subsequent* labours, the average *weight* at birth was 7 lbs. 3 oz. 2 grs., the extremes being 10 lbs. 1 oz. and 4 lbs. 8 oz., and the average weight on eighth day was 7 lbs. 205 grs. The average *length* of these same children was $19\frac{1}{4}$ inches, the greatest length having been $22\frac{1}{4}$ inches, and the shortest $16\frac{1}{4}$ inches.

From the above returns it would appear that, without regard to sex or labour, the child loses weight in the first seven days after birth, and that this loss averages about two ounces. I have sometimes known a child to gain weight in the first week, but this, in my experience, has been very rare.]

Sect. 5.—*Of Twins.*

When two or more children are included in the uterus at the same time, each has a separate placenta with umbilical cords and vessels: sometimes these placentæ are altogether distinct, and at other times they form but one cake.

Yet, by an instance that lately fell under my observation, it appears that sometimes twins have but one

placenta in common. Whether or not there were two sets of membranes, I could not discover, because they had been tore off by the gentleman who delivered the woman; but when the artery in one of the navel-strings was injected, the matter flowed out at one of the vessels belonging to the other; and the communication between them is still visible, though they are separated at the distance of three or four inches.

When two children are distinct, they are called *twins;* and *monsters*, when they are joined together; the first (according to the foregoing theory) are produced when different animalcula impregnate different ova; and the last are engendered when two or more animalcula introduce themselves, and are included in one ovum.

Sect. 6.—*Of Superfœtation.*

It was formerly imagined that a woman might conceive a second time during pregnancy, and be delivered of one child some weeks or months before the other could be ready for the world: but this opinion is now generally exploded; because the ovum fills the whole fundus uteri, and the gelatinous substance already mentioned locks up the neck and os internum, so as to hinder more semen from entering the womb and impregnating a second egg in any subsequent coition. Wherefore, in all those cases which gave rise to this supposition, it may be taken for granted that the woman was actually with child of twins, one of which lying near the os internum, might chance to die and mortify, so as that the membranes give way, and the dead fœtus is discharged, while the other remains in the uterus and is delivered at the full time. On the other hand, by some accident, the first and largest may be born some days or weeks before the full time, and afterwards the os tincæ contract so as to detain the other till the due period. At

other times the child that lies next to the fundus is the smallest, and follows after the birth of the other, sometimes dead and putrefied, and sometimes in an emaciated condition. See Collect. VI.

[To explain all the cases of supposed superfœtation by simply regarding them as examples of twin pregnancy is rather too summary a way of settling this confessedly difficult question. It shows, however, on the part of our author a bent of mind adverse to the marvellous, and believing nothing that is not supported by indisputable facts. This philosophic caution may, however, be carried too far; and though I fully admit that Smellie's explanation applies to a very great proportion of the alleged examples of superfœtation, and is countenanced by many high authorities, still there remain a few isolated cases of an authentic kind where the difficulties in the way of our adopting this solution are at least as great, if not greater, than those which beset the only other solution, *i. e.* superfœtation.

Modern writers draw a distinction between superfecundation or superconception (which means the successive impregnation of two or more ova) and superfœtation. But the difference here is only one of time, not of kind; superfecundation, as Scanzoni lays down, occurring before the formation of the decidua, and superfœtation subsequently to its formation. I see no valid reason for rejecting the possibility of superfecundation as thus defined, and it is probable that many cases of twin pregnancy have their origin in this way. On this hypothesis we can readily explain the cases of twins being born one black and the other white where the mother was sucessively impregnated by a negro and a European.

In attempting to resolve this much-vexed problem of superfœtation, the first question, proceeding in physiological order, which presents itself for consideration is this—"Does ovulation necessarily and at once become suspended upon the occurrence of impregnation?" If this suspension be proved to take place, all ground for controversy is removed.

The evidence which may be adduced on this point is briefly this:—
1. Menstruation is universally admitted to be the sign or indication that conception is possible, and therefore is proof of ovulation; and in the absence of any proof to the contrary, we may reasonably suppose that its occurrence after impregnation has taken

place should be viewed in the same light. Hence there is no reason for not accepting menstruation at this time, as at every other, as proof of ovulation. 2. It seems on all hands to be admitted that in cases of double uterus, or of extra-uterine gestation, a second impregnation may occur at an interval of one or more months. With these before us, then, we can hardly avoid the conclusion, that ovulation does go on for a limited time subsequently to conception; and in conformity with this, strong sexual desire continues in many women for some time after they have become pregnant.

Many of the opponents of the doctrine of superfœtation have urged, as Smellie does, that the mechanical impediments to the admission of the semen, and of the ovum, into the uterus, were such as to preclude the possibility of that contact which is a necessary condition of fecundation. But here again a careful comparative examination of these alleged obstacles shows that they are by no means insuperable. The operculum or mucous plug in the os uteri, which so many writers, including Wagner, Good, and Weitbrecht, believe to act in hermetically sealing up the cavity of the uterus during pregnancy, and thus presenting an insurmountable barrier to secondary impregnation,—is by no means constantly present, nor more dense in consistence than is often found in the non-pregnant state. I have sometimes been able to touch the membranes with the tip of my finger months before labour set in. "Frequent examinations have convinced me," writes Dr. M. Duncan, "that this plug is dense and well developed, and apparently impassable in the non-menstruating unimpregnated uterus; and as it does not prevent conception then, so there is no reason to ascribe to it this function in early pregnancy." During pregnancy, then, the cervical canal is not more contracted, nor its walls more unyielding, nor the mucous plug more impenetrable, than in the unimpregnated state.

Again, it has been said that the uterine cavity was so filled and occupied by the ovum "in possession," that no space existed for the passage of semen or the lodgment of another ovum. But the mechanical hindrances to conception in the early weeks of ordinary pregnancy are by no means so great as those sometimes existing in morbid states of the uterus, where conception does take place notwithstanding. Every practitioner has met with cases of pregnancy coexisting with scirrhus, epithelioma, corroding ulcer, and fibrous tumours of the uterus. I have published the history and

dissection of a case where a woman having an interstitial uterine fibroid, seven inches in diameter by two and a half inches in thickness, conceived of triplets and went to the ninth month of her pregnancy ('Clinical Memoirs on Diseases of Women,' p. 116). I lately had another very similar case under my care, except that the conception was single; the tumour had the same situation as ascertained by my hand when *in utero* for the purpose of performing version. Cases of an analogous kind to these have repeatedly been met with in the experience of other obstetricians. The researches of Coste, Duncan, Schultze, and Kussmaul would clearly show that up to the eighth or twelfth week of pregnancy—that is until the two layers of decidua are consolidated together—there would be sufficient space in the uterus to admit of a fresh impregnation taking place. An insuperable obstacle, however, to any such fresh impregnation would be the implantation of the ovum over the os uteri, or over the orifices of the Fallopian tubes, and the latter is in all probability a very common seat of attachment for the ovum. So far, then, for the anatomical and physiological objections to the doctrine of superfœtation.

Now, when we come to the clinical histories of the recorded examples of superfœtation, and find among them some which bear all the marks of trustworthiness, the observers being competent men, and the narrators honest, credible men, we are put in the position of being obliged to believe one or other of two marvels, the lesser of which, under all the circumstances, is superfœtation. Dr. Bonnar, in his admirable memoir upon this subject, has reviewed with much care and discrimination many of the well-authenticated instances of superfœtation, and on the facts reported in them, independently of anatomical or physiological considerations, gives his support to the doctrine. He arrives at two important conclusions connected with the question before us, one being that *fourteen days* is the earliest period after parturition at which conception can take place; and the other is, "that under favorable circumstances, *when the child is well developed and healthy*, the period of one hundred and eighty days may be set down as that at which, AT SOONEST, a child may be born and reared."

Dr. Bonnar takes up a new, and I would say an impregnable, position in favour of this doctrine; he gives the name and dates of three cases occurring in families of rank, where children who survived their birth and reached maturity at periods respectively of 182,

174, and 127 days after a previous accouchement of the mother. From such incontrovertible facts he very fairly makes the deduction that it is easier to believe in the occurrence of superfœtation with regard to these and other suchlike cases, than it is to believe the alternative conclusion that children of so short gestation could be viable. (For Dr. Bonnar's paper see 'Edinburgh Monthly Journal,' January, 1865.)

Taking it for granted, then, that anatomy and physiology show the possibility of secondary impregnation up to the third month of pregnancy, a difficulty presents itself with regard to those cases where the secondary fœtus was born at such a time posteriorly to the primary as to imply that the secondary conception took place at a period later than three months after the primary one. This objection is met by Matthews Duncan, and in the absence of conclusive evidence, that the primary fœtus was mature at birth, as proved by its weight and length, &c., we may safely accept his solution, which is as follows:—"If we suppose in an instance of this kind that the first child is born prematurely, but within the limits of viability, we thus gain two months; and if impregnation may take place between two and three months after conception, we have thus four or five months of interval accounted for between the births of successive viable infants." ('Researches in Obstetrics,' p. 176.) In most of the authentic cases of superfœtation the secondary ovum must have attained a considerable bulk when the birth of the first took place, and this suggests the question, how its presence *in utero* was overlooked, after the extrusion of the primary fœtus and placenta? This is a difficulty I admit, though not of a physiological kind, nor of any great magnitude; but as every practical man will form his own estimate of it, *I* shall leave it unanswered.]

Sect. 7.—*Of Abortions.*

A miscarriage that happens before the tenth day was formerly called an *efflux*, because the embryo and secundines are not then formed, and nothing but the liquid conception or genitura is discharged. From the tenth day to the third month, it was known by the term *expulsion*, the embryo and secundines being still so small that the woman is in no great danger from violent flooding.

If she parted with her burden betwixt that period and the seventh month, she was said to suffer an abortion: in which case she underwent greater danger, and was delivered with more difficulty than before; because the uterus and vessels being more distended, a larger quantity of blood was lost in a shorter time, the fœtus was increased in bulk, and the neck of the womb is not yet fully stretched: besides, should the child be born alive, it will be so small and tender that it will not suck, and scarce receive any sort of nourishment.

When delivery happens between the seventh month and full time, the woman is said to be in labour. But, instead of these distinctions, if she loses her burden at any time from conception to the seventh or eighth, or even in the ninth month, we now say indiscriminately, she has miscarried.

Hippocrates alleges that a child born in the seventh month, sometimes lives: whereas if it comes in the eighth it will probably die: because all healthy children, says he, make an effort to be delivered in the seventh month; and if they are not then born, the nisus is repeated in the eighth, when the child must be weakened by its former unsuccessful attempt, and therefore not likely to live; whereas, should the second effort be deferred till the ninth, the fœtus will by that time be sufficiently recovered from the fatigue it had undergone in the seventh. Experience, however, contradicts this assertion; for the older the child is, we find it always (*cæteris paribus*) the stronger, consequently the more hardy and easily nursed: neither is there any sufficient reason for adhering to the opinion of Pythagoras on this subject, who declares that number eight is not so fortunate as seven or nine.

The common term of pregnancy is limited to nine solar months, reckoning from the last discharge of the catamenia: yet in some, though very few, uterine gestation exceeds that period; and as this is a possible case, we ought always to

judge on the charitable side, in the persuasion that it is better several guilty persons should escape, than one innocent person suffer in point of reputation. See Collect. VII.

[Up to Smellie's time the erroneous and fanciful dogma that a seven months' fœtus was more likely to survive than one of eight months, was universally held by medical men, just as it still is believed by non-medical people. His utter rejection of it, under the teaching of experience, very strikingly exhibits how little influenced his mind was by tradition or authority, and with what honest impartiality he read the book of nature. "It is strange," writes Dr. Parvin, "that an error so clearly exposed by Smellie in 1752 should be upheld by an American teacher of obstetrics in 1821. The late Dr. John W. Francis, of New York, in his preface to the American edition of 'Denman's Midwifery,' observes, 'the singular circumstance that a child of seven months' gestation has greater chance of living than one of eight was noticed by Hippocrates.'" ('The American Practitioner,' December, 1875.)

As the date of a fruitful coitus can very seldom be known, we are obliged in practice to calculate the duration of pregnancy from the last discharge of catamenia, and reckoning this way, one author lays it down that "the common term of pregnancy is limited to nine solar months," which may represent a period of 273, 274, 275, or 276 days, according to the months included. On this point I think that modern investigation tends to corroborate the statement of Smellie. From calculations I myself have made, based upon a pretty large number of data very carefully obtained among my private patients, I find that the interval between the last day of the last menstruation and the accession of parturition averaged 276 days; among primiparæ this interval averaged $275\frac{1}{6}$ days, and among multiparæ $276\frac{7}{8}$ days. In some of my cases the interval was extended to 300 days, and in one case to 312 days. Duncan's average in all cases is "the two hundred and seventy-eighth day after the end of the last menstruation." This author very properly insists on our distinguishing between the act of a fruitful coitus and the act of conception—the two acts not necessarily being contemporaneous, but most probably separated by an interval of some hours or days. The common idea, therefore, that conception dates from the moment of a successful insemination, is not physiologically correct. As the whole duration of pregnancy is made up of a definite number of

menstrual eyeles, it is but reasonable to suppose that the length of the former would be influeneed by the length of the latter in individual eases. My own experienee favours this eonelusion, and the latest writer upon this subjeet,—Professor Simpson,—thus expresses himself:—"If we are to make the elosest possible approaeh to the caleulation of the probable date of her eonfinement, we must above all have regard to her own individual menstrual type, and aseertain what is with her the usual length of a menstrual eyele." "We have, therefore, to find out the number of days between the eommeneements of the two menstruations that preeeded coneeption and multiply the figure by ten, and within a range of five days earlier or later the birth of the impregnated ovum will probably take place." ('Emmenologia,' Deeember, 1875.)

Harvey's referenee[1] to the pregnancy of the Virgin Mary has been quoted by several writers of eminenee (Montgomery, Tyler Smith, Duncan, &e.), as though it earried very great weight in deeiding the question of the normal term of utero-gestation in the human female. But in truth it is of no value whatever, as our dates of the Annuneiation and of the Nativity do not derive any authority from the Holy Scriptures, but were fixed by the early Fathers in aecordanee with tradition and their own judgment on the matter.

"The dates are derived," says Professor Simpson, "only from the teaehers of the Roman Catholie Chureh, and when their true meaning is investigated it is found that the 25th Mareh was held as Lady-day in Pagan Rome in honour of Cybele, the mother of the Babylonian Messiah, long before the era of our Lord; while the 25th of December was kept among many Gentile peoples as the birth day of the son of that 'Queen of Heaven.'" ('Emmenologia,' Deeember, 1875.)

It is held by many authorities that the aptitude for eoneeption is greatest during the few days immediately following menstruation, and this reeeives strong support from what has been stated regarding the ordinary period of pregnaney.

There can be no doubt but that the length of human gestation is a variable period. All the direet researehes whieh have been made respecting it tend to establish this eonelusion. "The variation in the term of utero-gestation, oeeurring as it does ehiefly in the human speeies, I believe to depend on the habits of life, feebleness of body, and on the various affeetions of the mind." So

[1] 'The Works of William Harvey, M.D.' Sydenham Society's edition, p. 529.

writes the illustrious Harvey (op. cit., p. 531). This variation is not peculiar to the human female; it has been abundantly proved by Lord Spencer and by Tessier that the term of gestation in some of our domestic animals, such as the cow, the mare, the bitch, and the sow—in all of which the dates of intercourse and of parturition can be ascertained with exactness—is liable to considerable variation. Lord Spencer's observations in regard to cows show that the period fluctuates between 245 days and 301 days, whilst 284 days were found to represent the duration of pregnancy in the largest number of instances. Where there is such variability in regard to this function among lower animals, it is only to be expected that the same, or even greater, irregularity should occur in the human subject.

Many reasons concur to make it desirable that we could fix the outside limit of utero-gestation—in other words, the *ultimum tempus pariendi*. There is good evidence to show that this may exceed 300 days, dating even from the time of fruitful connection, but how much beyond this cannot be positively defined. The other limit, short of which gestation fails to accomplish its great object of forming a being capable of independent existence, would seem to lie somewhere between 170 and 180 days, a child born at this stage of pregnancy being capable, under exceptionably favorable circumstances, of surviving.

Sect. 8.—*Of False Conceptions and Moles.*

It was formerly supposed, that if the parts of the embryo and secundines were not separated and distinctly formed from the mixture of the male and female semen, they formed a mass, which, when discharged before the fourth month, was called a *false conception;* if it continued longer in the uterus so as to increase in magnitude, it went under the denomination of a *mola*. But these things are now to be accounted for in a more probable and certain manner.

[The terms *false conception* and *mole* should be banished from modern nomenclature. They have no reference etymologically to the nature or characters of the products to which they were applied; and they have really no definite pathological significance. Added to

this, they were used by the older writers with such latitude as to mean anything or nothing. Any one who is curious enough to study the subject of moles and false conceptions under the varied and important aspects in which it was regarded by the older obstetricians, should consult Lamzweerde's 'Historia Naturalis Molorum Uteri.' (Lugd. Batav. 1686.)

The employment of the term *mole* by some modern writers, who would attach a precise meaning to the word, is rather to be deprecated, as tending to create confusion, as well as to take the place of more exact names based on a sound pathology.]

Should the embryo die (suppose in the first or second month) some days before it is discharged, it will sometimes be entirely dissolved; so that when the secundines are delivered, there is nothing else to be seen. In the first month the embryo is so small and tender, that this dissolution will be performed in twelve hours; in the second month, two, three, or four days will suffice for this purpose; and even in the third month, it will be dissolved in fourteen or fifteen: besides, the blood frequently forms thick laminæ round the ovum, to the surface of which they adhere so strongly, that it is very difficult to distinguish what part is placenta, and what membrane. Even after the embryo and placenta are discharged in the second or third month, the mouth and neck of the womb are often so closely contracted, that the fibrous part of the blood is retained in the fundus, sometimes to the fifth or seventh day; and, when it comes off, exhibits the appearance of an ovum, the external surface, by the strong pressure of the uterus, resembling a membrane; so that the whole is mistaken for a false conception.

This substance, in bigness, commonly equals a pigeon or hen egg; or if it exceeds that size, and is longer retained, is distinguished by the appellation of *mola*: but this last generally happens in women betwixt the age of forty-five and fifty, or later, when their menses begins to disappear; sometimes from internal or external accidents that may produce con-

timal floodings. If the catamenia has ceased to flow for some time in elderly women, and return with pain, such a symptom is frequently the forerunner of a cancer; before or after this happens, sometimes a large flesh-like substance will be discharged with great pain, resembling that of labour; and, upon examination, appears to be no more than the fibrous part of the blood, which assumes that form by being long pressed in the uterus or vagina. See Collect. VIII.

[That the embryo ever *dissolves* in the liquor amnii, as stated by our author, is highly improbable except in the first few weeks of its development. Should this take place, however, the ovum may continue to enlarge and be retained for two or three months; or, if expelled sooner, may have a size that would seem to show gestation to be further advanced than it really was. Modern investigation favours the idea that the ovum may continue to grow after a very early destruction of the embryo; but on the other hand the blighting of the embryo may be the consequence of a previously existing hydropic state of the amnios. As a general rule, once the vitality of the embryo is compromised, the ovum collapses and undergoes a sort of maceration, or species of decomposition though not of a putrefactive kind *unless atmospheric air have got access to the uterine cavity*. That the presence or absence of atmospheric air should exercise so great an influence upon the fœtus after its death is very remarkable, and has not attracted much notice. My attention was strongly drawn to the fact, by observing how rapidly putrefactive decomposition, with the abundant generation of fetid gases, was set up in the dead fœtus once the membranes were ruptured. I have seen the uterus become quite tympanitic from this cause after the accession of labour and before delivery. This cause of intra-uterine putrefaction of the fœtus was clearly pointed out and illustrated, many years ago, by M. Martin, *le jeune* (of Lyons), in his 'Mémoires de Médecine et de Chirurgie pratique,' &c. (Paris, 1835).]

In this place it will not be amiss to observe, that the glands of the uterus and vagina will sometimes increase and distend the adjacent parts to a surprising degree. If (for example) one of the glands of the uterus be so obstructed

as that there is a pressure on the returning vein and excretory duct, the arterial blood will gradually stretch the smaller vessels, and consequently increase the size of the gland, which will grow larger and larger, as long as the force of the impelled fluid is greater than the resistance of the vessels that contain it; by which means a very small gland will be enlarged to a great bulk, and the uterus gradually stretched as in uterine gestation, though the progress may be so slow as to be protracted for years instead of months. Nevertheless, the os internum will be dilated, and the gland (if not too large to pass) will be squeezed into the vagina, provided it adheres to the uterus, by a small neck: nay, it will lengthen more and more, so as to appear on the outside of the os externum; in which case it may be easily separated by a ligature. This disease will be the sooner known and easier remedied, the lower its origin in the uterus is. But should the gland take its rise in the vagina hard by the mouth of the womb, it will show itself still sooner; and a ligature may be easily introduced, provided the tumour is not so large as to fill up the cavity, and hinder the neck of it from being commodiously felt. Though the great difficulty occurs when the gland is confined to the uterus, being too much enlarged to pass through the os internum.

[There can be little doubt that our author is here speaking of polypoid and other growths from the uterus and vagina, and would trace their origin to glandular obstruction of some kind or other. It is needless to remind the reader, however, that the very first principles of true pathology can hardly be said to have been defined, when Smellie was writing his lectures.]

Sometimes all or most of the glands of the uterus are thus affected, and augment the womb to such a degree, that it will weigh a great many pounds, and the woman is destroyed by its pressure upon the surrounding parts; but should this indolent state of the tumour be altered by any

accident that will produce irritation and inflammation, the parts will grow scirrhous, and a cancer ensue.

This misfortune for the most part happens to women when their menstrual evacuations leave them; and sometimes (though seldom) to child-bearing women, in consequence of severe labour.

Some people have affirmed that the placenta, being left in the uterus after the delivery of the child, grows gradually larger. But the contrary of this assertion is proved by common practice; from which it appears, that the placenta is actually pressed into smaller dimensions, and sometimes into a substance almost semi-cartilaginous: for, after the death or delivery of the child, the secundines receive no farther increase or growth. Dropsies and hydatids are also supposed to be formed in the uterus, and discharged from thence together with air or wind. The ovaria are sometimes affected in the same manner, are inflamed, imposthumate, grow scirrhous, cancerous, and the patient is destroyed by the discharge which gradually fills the abdomen with pus and ichor; so that all these complaints, if known, ought to be obviated in the beginning. See Collect. IX.

Sect. 9.—*Of the Placenta and Membranes.*

I have already observed that the ovum is formed of the placenta with the chorion and amnion, which are globularly distended by the inclosed waters that surround the child. The placenta is commonly of a round figure, somewhat resembling an oat-cake, about six inches in diameter, and one inch thick in the middle, growing a little thinner towards the circumference: it is composed of veins and arteries, which are divided into an infinite number of small branches, the venous parts of which unite in one large tube, called the *umbilical vein,* which brings back the blood, and

is supposed to carry along the nutritive fluid from the vessels of the chorion and placenta, to the child, whose belly it perforates at the navel; from thence passing into the liver, where it communicates with the vena portarum and cava. It is furnished with two arteries, which arise from the internal iliacs of the child, and running up on each side of the bladder perforates the belly where the umbilical vein entered; then they proceed to the placenta, in a spiral line, twining around the vein, in conjunction with which they form the funiculus umbilicalis, which is commonly four or five hand-breadths in length, sometimes only two or three, and sometimes it extends to the length of eight or ten. The two arteries, on their arrival at the inner surface of the placenta, are divided and subdivided into minute branches, which at last end in small capillaries that inosculate with the veins of the same order. These arteries, together with the umbilical vein, are supposed to do the same office in the placenta which is afterwards performed in the lungs by the pulmonary artery and vein, until the child is delivered and begins to breathe: and this opinion seems to be confirmed by the following experiments. If the child and placenta are both delivered suddenly, or the last immediately after the first; and if the child, though alive, does not yet breathe, the blood may be felt circulating sometimes slowly, at other times with great force, through the arteries of the funis to the placenta, and from thence back again to the child, along the umbilical vein. When the vessels are slightly pressed, the arteries swell between the pressure and the child, while the vein grows turgid between that and the placenta, from the surface of which no blood is observed to flow, although it be lying in a basin among warm water. As the child begins to breathe, the circulation, though it was weak before, immediately grows stronger and stronger; and then in a few minutes the pulsation in the navel-string becomes more languid, and at last entirely stops. If after the child is

delivered, and the navel-string cut, provided the placenta adheres firmly to the uterus, which is thereby kept extended; or, if the womb is still distended by another child; no more blood flows from the umbilical vessels than what seemed to be contained in them at the instant of cutting; and this, in common cases, does not exceed the quantity of two or three ounces; and finally, when, in consequence of violent floodings, the mother expires either in time of delivery or soon after it, the child is sometimes found alive and vigorous, especially if the placenta is sound; but if tore, then the child will lose blood as well as the mother.

The external surface of the placenta is divided into several lobes, that it may yield and conform itself more commodiously to the inner surface of the uterus, to which it adheres, so as to prevent its being separated by any shock or blows upon the abdomen, unless when violent.

Those groups of veins and arteries which enter into the composition af the placenta, receive external coats from the chorion, which is the outward membrane of the ovum, thick and strong, and forms three fourths of the external globe that contains the waters and the child, the remaining parts being covered by the placenta; so that these two in conjunction constitute the whole external surface of the ovum. Some indeed allege that these are enveloped with a cribriform or cellular substance, by which they seem to adhere by contact only to the uterus; and that the inner membrane of the womb is full of little glands, whose excretory ducts, opening into the fundus and neck, secrete a soft thin mucus (as formerly observed) to lubricate the whole cavity of the uterus, which beginning to stretch in time of gestation, the vessels that compose these glands are also distended; consequently a greater quantity of this mucus is separated and retained in this supposed cribriform and cellular substance, the absorbing vessels of which take it in and convey it along the veins for the nourishment of the

child. The womb being therefore distended in proportion to the increase of the child, those glands are also proportionably enlarged; by which means a larger quantity of the fluid is separated, because the nutriment of the child must be augmented in proportion to the progress of its growth; and this liquor undergoes an alteration in quality as well as in quantity, being changed from a clear thin fluid into the more viscous consistence of milk. In some cases this mucus hath been discharged from the uterus in time of pregnancy, and both mother and child weakened by the evacuation; which may be occasioned by the chorion's adhering too loosely, or being in one part actually separated from the womb.

Formerly, it was taken for granted by many, that the placenta always adhered to the fundus uteri. But this notion is refuted by certain observations; in consequence of which we find it as often sticking to the sides, back, and fore parts, and sometimes as far down as the inside of the os uteri.

When the placenta is delivered, and no other part of the membrane tore except that through which the child passed, the opening is generally near the edge or side of the placenta, and seldom in the middle of the membranes; and a hog's bladder being introduced at this opening, and inflated, when lying in water, will show the shape and size of the inner surface of the womb, and plainly discover the part to which the placenta adhered.

The chorion is, on the inside, lined with the amnion, which is a thin transparent membrane, without any vessels so large as to admit the red globules of blood. It adheres to the chorion by contact, and seems to form the external coat of the funis umbilicalis.

This membrane contains the serum, in which the child swims; which fluid is supposed to be furnished by lymphatic vessels that open into the inner surface of the amnion. If this liquid is neither absorbed into the body

of the fœtus, nor taken into the stomach by suction at the mouth, there must be absorbing vessels in this membrane, in the same manner as in the abdomen and other cavities of the body, where there is a constant renovation of humidity.

The quantity of this fluid, in proportion to the weight of the fœtus, is much greater in the first than in the last month of gestation, being in the one perhaps ten times the weight of the embryo, whereas in the other it is commonly in the proportion of one to two: for six pounds of water surrounding a fœtus that weighs twelve pounds, is reckoned a large proportion, the quantity being often much less; nay, sometimes there is very little or none at all.

In most animals of the brute species, there is a third membrane called *allantois*, which resembles a long and wide blind-gut, and contains the urine of the fœtus. It is situated between the chorion and amnion, and communicates with the urachus that rises from the fundus of the bladder, and runs along with the umbilical vessels, depositing the urine in this reservoir, which is attached to its other extremity. This bag hath not yet been certainly discovered in the human fœtus, the urachus of which, though plainly perceivable, seems hitherto to be quite imperforated.

From the foregoing observations upon nutrition, it seems probable, that the fœtus is rather nourished by the absorption of the nutritive fluid into the vessels of the placenta and chorion, than from the red blood circulated in full stream from the arteries of the uterus to the veins of the placenta, and returned by the arteries of the last to the veins of the first, in order to be renewed, refined, and made arterial blood in the lungs of the mother.

Yet this doctrine of absorption is clogged with one objection, which hath never been fully answered; namely, That if the placenta adheres to the lower part of the uterus, when the os internum begins to be dilated a flooding

immediately ensues; and the same symptom happens upon a partial or total separation of the placenta from any other part of the womb; whereas no such consequence follows a separation of the chorion.

The new theorists indeed observe, that there is no necessity for a supply of red blood from the mother; because the circulating force in the vessels of the fœtus produces heat and motion sufficient to endue the fluids with a sanguine colour; that neither is there occasion for returning and refining this blood in the lungs of the mother, because that office is sufficiently performed in the placenta, until the fœtus is delivered, when its own lungs are put to their proper use; and lastly, that the blood of the mother is too gross a fluid to answer the occasions of the fœtus. Certain it is, the chick in the egg is nourished by the white which is forced along the vessels, and the quantity of red blood increases in proportion to the growth of the contained embryo or fœtus, without any supply from the hen.

On the whole, the opinions broached upon the nutrition of the embryo and fœtus in utero have been various, as well as those that are adopted concerning the *modus* of conception.

BOOK II.

CHAPTER I.

OF THE DISEASES INCIDENT TO PREGNANT WOMEN; BEING EITHER SUCH AS IMMEDIATELY PROCEED FROM PREGNANCY, OR SUCH AS MAY HAPPEN AT ANY OTHER TIME; AND, IF NOT CAREFULLY PREVENTED OR REMOVED, MAY BE OF DANGEROUS CONSEQUENCE BOTH TO MOTHER AND CHILD.

SECT. I.—*Of Nausea and Vomiting.*

THE first complaint attending pregnancy is the nausea and vomiting, which in some women begin soon after conception, and frequently continue till the end of the fourth month. Most women are troubled with this symptom more or less, particularly vomiting in the morning; some who have no such complaint in one pregnancy, shall be violently attacked with it in another; and in a few it prevails during the whole time of uterine gestation.

The vomiting, if not very violent, is seldom of dangerous consequence; but, on the contrary, is supposed to be serviceable to the patient, by unloading the stomach of superfluous nourishment, thereby carrying off or preventing too great a turgency in the vessels of the viscera and uterus; and by creating a kind of straining or nisus in the parts, which will assist the fundus and neck of the women in stretching. Nevertheless, if the straining is too great, it may endanger a miscarriage.

Perhaps this complaint is chiefly occasioned by a fulness of the vessels of the uterus, owing to obstructed catamenia,

the whole quantity of which cannot as yet be employed in the nutrition of the embryo: over and above this cause, it has been supposed that the uterus being stretched by the increase of the ovum, a tension of that part ensues, affecting the nerves of that viscus, especially those that arise from the sympathetici maximi, and communicate with the plexus at the mouth of the stomach. Whatever be the cause, the complaint is best relieved by blooding, more or less, according to the plethora and strength of the patient; and if she is costive, emollient glysters and opening medicines, that will evacuate the hardened contents of the colon and rectum; so that the viscera will be rendered light and easy, and the stretching fulness of the vessels taken off. A light, nutritive, and spare diet, with moderate exercise, and a free open air, will conduce to the removal of this complaint. See Cases No. 44, 45, 46, et seq.

[All cases of nausea and vomiting dependent on pregnancy might conveniently be disposed in three classes, according to the amount or degree of sickness present. In the *first* class sickness is confined to the forenoon, does not always or often end in vomiting, and generally passes away altogether at the period of quickening. In the *second* class vomiting is of more frequent occurrence, is not confined to the forenoon, and continues or commences to annoy the patient after she has passed the epoch of quickening. In the *third* group we may range those exceptional cases where actual vomiting is so frequent and persistent that nutrition is arrested, wasting and debility rapidly ensue, and finally a febrile condition of the whole system, with symptoms of exhaustion, come on, resulting at last either in the death of the patient, or, in a very few instances, the cessation of vomiting, with or without spontaneous abortion.

Cases of this extreme kind are happily of rare occurrence. In the course of my experience in hospital and private practice I have met with only a very few instances where the symptoms were so urgent and so rebellious to treatment as to raise the question of inducing abortion, and in only one have I felt justified in resorting to this grave alternative. This was a primiparous patient, and the sickness began rather suddenly on 20th July, about four or five weeks from

the probable date of eoneeption. By the 20th August it had redueed her to sueh a state of extreme exhaustion, that it was manifest to her two medical attendants as well as to myself, that her life eould not possibly endure many days longer. Every available mode of treatment was fruitlessly tried except dilatation of the eervix;—this remedy not having then been introdueed, by Mr. Copeman, to the notice of the profession. As a last resource I indueed abortion. She narrowly escaped with her life, but reeovered perfectly, and has passed through two pregnancies since without experieneing any siekness worth speaking of. ('Dub. Jour. of Med. Seienee,' May, 1873).

Very many eases of this dangerous form have been reeorded by English, Freneh, German, and Ameriean obstetrieians. It may be present in first or subsequent pregnaneies, but it is commonly supposed that women in their first pregnaneies are more obnoxious to it, and the statisties I have eolleeted give some eonfirmation to this opinion.

Another interesting question eonneeted with exeessive vomiting is the particular *period of pregnancy* at which it is most apt to oeeur. Of the reeorded eases in whieh this eireumstanee has been noted, vomiting in the three months preeeding quiekening was of much more frequent oeeurrenee than in the months after quiekening. In a very few instanees it began about one month after the supposed time of eoneeption. M. Gueniot has given some attention to this point, and states,[1] that of *forty-three* eases eollected by him, the vomiting set in nine times in the first weeks of pregnancy; fifteen times at the end of the first month; nine times in second month; five times in third month; once in fourth month; twiee in fifth month; and twiee in the sixth month. In general terms, then, it may be stated that no pregnancy, and no period of pregnaney, exeept perhaps the first and the ninth months, is seeure against the oeeurrenee of this most formidable eoncomitant. It may reeur in sueeessive pregnaneies. Thus Burns had to induee labour three times in one patient, on aeeount of uncontrollable vomiting;[2] and Mr. Garraway had to do it twiee in a patient under his eare.[3] On the other hand, the patient on whom Dr. Munro operated passed through her sueeeeding pregnaney with only "slight nausea and sickness," whieh readily yielded

[1] Quoted by Anquetin in 'Rev. Medicale,' 1865, vol. ii.
[2] 'Midwifery,' p. 265, tenth edition.
[3] 'Brit. Med. Jour.,' October, 1857.

to treatment;[1] and other cases of a like kind are reported. As regards the *etiology* of this excessive sympathetic disturbance, I fear it must be confessed we are as yet very much in the dark. Several explanations have been put forward, but none of them rests on any extended series of clinical or pathological facts, and can only apply to occasional instances. We may, however, regard it as pretty well established that there are different morbid conditions, which, being superadded to the gravid state, may aggravate or excite the symptoms in question. These are, for example, congestive inflammation of the os and cervix; an irritable condition of the cervix uteri; ulceration of the os uteri; inflammation of the deciduæ; the effect of gravitation of the ovum "on some sensitive part near the cervix" (Monro); or displacement of the womb.

Now, after making every allowance for the influence of these causes, there yet remains a large proportion of cases in which no evidence exists of any of them having been in operation, and for all such cases, the only explanation to be offered is that which attributes the sickness to overdistension of the uterine nerve-fibres, and there are some clinical facts which apparently give support to this theory. Thus Robert Lee and Dubois have each related cases where the vomiting ceased immediately upon the discharge of the liquor amnii. In one case of Lee's the puncture of the membranes was not followed by any perceptible discharge of water; nevertheless, the vomiting "began immediately to subside, and she went to the full period, and was safely delivered of a living child" ('Clinical Midwifery,' p. 108, second edition). In another case (No. 68) related by the same observer, he tells us, "the vomiting ceased immediately after" the puncture of membranes and discharge of the liquor amnii, "and the fever subsided, though the fœtus was not expelled for several weeks." A very striking case too was that of Dr. Campbell's (No. 35 in my table at page 143). Here a sound was passed into the uterus and the membranes ruptured. She vomited less that night, and next morning could retain food well; she improved from day to day, but was not delivered until twelve days after the operation.

On the other hand, there are several instances where the gastric disturbance ceased upon the death of the fœtus only, and before any sign of abortion made its appearance; and again, in other cases where parturition was artificially induced, the vomiting persisted until the

[1] 'Glasgow Med. Journ.,' August, 1872.

ovum was expelled, and these two series of facts are hardly reconcilable with the theory in question.

The flexion theory has lately found a warm advocate in Dr. Graily Hewitt. His paper was read before the Obstetrical Society of London, and is published in the thirteenth volume of its transactions. But, with the utmost respect for the author, I must candidly avow that, after a very attentive study of his essay, as well as of the discussion which followed its reading before the Society, I could not find any facts or arguments to justify the conclusion that retroflexion or anteflexion of the gravid uterus is more than a very rare concurrent cause of the vomiting of pregnancy. The soundness of the theory is only to be tested by facts, but an appeal to such facts as are obtainable, brings out a mass of evidence which plainly forbids our accepting the statement that uterine malposition is "*the* almost universal cause of the sickness of pregnancy:" nay, the evidence rather tends to show that misplacement of the uterus is a very rare accompaniment of the vomiting of pregnancy.

I have met with several cases of retroversion of the gravid uterus, and in none of these cases was vomiting a prominent symptom, and in most of them it was entirely absent. In a considerable proportion of the recorded cases of excessive sickness, this (the sickness), as already stated, was present in the sixth, seventh, or eighth month of pregnancy, when ante or retroflexion was not only quite absent but the next thing to an impossibility. Dr. Barnes seems to think that the normal condition of the uterus in early pregnancy is one of slight anteversion, occasioning a change in the anterior wall of the vagina, which he regards as a valuable diagnostic mark of the gravid state. —(*Brit. Med. Jour.* 1868, vol. ii, p. 204.)

Dr. Oldham has recorded a remarkable case in which the uterus was found retroflexed at the full term, and had probably been in this faulty position all through pregnancy; and yet in this history there is no mention of sickness.—('Obstet. Trans.,' Lond., I, 317.)

Dance, Dubois, Stoltz, and Kieller, have had opportunities of examining the bodies of women dying of the excessive vomiting of pregnancy, but in none of these autopsies was any displacement of the womb found to exist. Now, I do not want altogether to deny that displacement may give rise to the sickness, but merely to show that it can only be a very rare and exceptional cause of it. Moreau and Briau had a few cases (three or four) in which misplacement of the

[1] 'Obstet. Trans.,' Lond., i, 317.

gravid uterus had, beyond doubt, very much to do with the vomiting, as this abated after the malposition was rectified. And in Dr. Munro's case, already cited, it is possible that the vomiting (which began so early as five weeks after the last menstruation) may in some degree have depended on the anteflexion; but it did not appear that there was any jamming of the fundus uteri, and the sound when introduced went upwards freely about five and a half inches. M. Stoltz relates a case he was called to, of this excessive vomiting in the third month of a first pregnancy, where he recognised the existence of retroversion of the uterus; and when the womb was replaced—and this could be readily done—there was a temporary suspension of the sickness. As the rectification could not be permanently maintained, we cannot say whether, if such had been accomplished, the cessation of the sickness would have lasted. Eventually abortion was induced as the only way of saving the life of the woman, and with a most successful result.

It is important to bear in mind that this vomiting, of which we are speaking, has no pathognomonic or specific character by which it may be recognised; its diagnosis must rest, therefore, on the co-existence of pregnancy, and the absence of any other cause for it, such as gastric, cerebral, hepatic, or renal disease. The purest cases, I believe, are those where it commences soon—*i.e.*, a few weeks after conception; and its dating from this early stage may be regarded as a very strong evidence of the vomiting being a direct consequence of the gravid state. In several of the most marked cases the vomiting set in very soon after impregnation. Thus in Dr. Munro's case it began five weeks after the last menstruation. In the case to be hereafter related, it set in not later than the sixth week of pregnancy; in a fatal case communicated to me by the attending physician, vomiting began a fortnight after conception; and in Dubois' fifth fatal case sympathetic disturbance of the stomach was the very first symptom of pregnancy, appearing even before there was time to know if the menstruation was suppressed.

On the other hand, I think there are good grounds for supposing that in many of the severe cases, where sickness commenced after quickening, it was not exclusively due to direct sympathy with the uterus, but arose in part under the influence of some superadded complication. The cases recorded by Dr. Hardy, and by Dr. George Kidd ('Dub. Quar. Jour.' xxxviii, pp. 12 and 253), are illustrations of

this statement. In each of them pregnancy was advanced to the seventh month, and in each there was present some other cause adequate to account for the prominent symptom. In one it was phthisis; in another gastritis apparently; and in the third constipation, which being removed the vomiting subsided. For the sake of diagnostic precision, therefore, we should distinguish between the sickness *of* pregnancy, and sickness *in* pregnancy.

The duration of the vomiting, before it brings the patient into a position of danger, is liable to a good deal of variation. In several instances this period has been under three or four weeks, and in others it was extended to eight, nine, or ten weeks. In the above-mentioned case related to me, death took place in six weeks. Of course very much will depend on the constitution and previous health of the patient, as well as the degree of intolerance shown by the stomach. An analysis of twenty-three fatal cases, by M. Gueniot, showed the mean duration of the disease to have been three months, which accords with the statement just made.

The symptoms which are present in these extreme cases are very well laid down by Dubois, whose description has been quoted by nearly every succeeding writer upon this subject. They are briefly these:—Excessive vomiting, all food, and sometimes even the smallest quantity of pure water, being rejected: emaciation and extreme debility, so that syncope takes place under slight exertion, and obliges the patient to keep her bed; a febrile condition of the system, and an acid sour smell off the breath. Such a combination of symptoms would plainly indicate the patient to be in great peril, and, if medication and local mechanical treatment have been judiciously tried without avail, art holds out only one possible mode of escape for the woman, and that is by terminating pregnancy, which has brought her into this all but moribund condition. If relief be not speedily given, and she be allowed to sink any lower, the time will have gone by for the intervention of human aid to save her life, and she will pass into that hopeless condition, which Dubois calls the third stage, characterised by increased prostration, constant headache, impairment of vision, tendency to somnolence, and derangement of the intellectual faculties. To operate, he remarks, under these circumstances, would only bring obloquy on our art, and, perhaps, hasten the patient's end.

It has been urged by the opponents of artificial abortion, that we should leave it to nature to induce parturition in those severe

eases where medieine fails to give relief: but this would be to abandon the patient to almost certain death, for the eases where in the advanced stage the vomiting has ceased, or spontaneous abortion has come on, are lamentably few: whilst the number of recorded eases where a fatal issue has taken plaee under these eircumstances is very considerable. Dr. Munro, the latest writer on this subjeet, refers to twenty such fatalities. But with a very moderate amount of research I have been able to eolleet elose on *fifty* authentically recorded cases, and I know of others which have not been published. Thus twenty fatal eases had come within the observation of Dubois; Churchill in like manner mentions four; Tyler Smith three; Stoltz three; Chailly two; Danee two; one eame under my own knowledge; and single cases are recorded by Murphy, Haighton, Lee, Maygrier, M. Hall, Breschet, Johnson, Danyau, Ulrich, Forget, Kieller, Lobstein, Caradee, Rigaud, Blot, Bradley, Lancercaux, not including those cases where death took place after the occurrence of abortion.

From this sad array let us turn, and see what suceess has resulted from the timely intervention of art under the circumstances above described. When Paul Dubois and Danyau advocated this measure before the Académie Nationale de Medieine, in 1852, they could only adduce four or five cases in support of it, one of which cases oeeurred in the practiee of Dubois himself, and was at the time a solitary suceess againt three failures.

Since then the number of sueeessful cases has greatly multiplied, so that with very little trouble I was able to get the histories of *thirty-eight* authentic cases where this alternative measure was resorted to after every other mode of treatment had been tried in vain. Annexed is a tabular statement of these cases, showing, so far as data were given, the number of the pregnancy, the period of pregnancy at which the sickness was, the result of the practice, with a refereneе to the name of the operator and of the publieation where it is reported.

Cases of abortion artificially induced on account of excessive vomiting.

No.	Pregnancy.	Period of Pregnancy.	Result.	Authority.
1	Primipara	3rd month .	Recovered	Munro—'Glas. Med. Journ.,' Aug., 1872.
2	—	7th month .	Do.	Davis—'Obstetric Medicine.
3	—	8th month .	Do.	Ibid.
4	—	6th month .	Do.	Ibid.
5	Multipara	6th month .	Do.	Edwards—'Ranking's Abs.,' iv.
6	Do.	3rd month .	Do.	Churchill—'Dis. of Women,' 630.
7	Do.	3rd month .	Died	Ibid.
8	Do.	8th month .	Recovered	Copeman—'Obs. Trans.,' xiii.
9	—	8th month .	Do.	Merriman—'Med. Chir. Tr.,' iii.
10	—	—	Do.	Hergott.
11	—	—	Died	Anbenas.
12	—	—	Recovered	Burns—'Midwifery,' 265.
13	Multipara	—	Do.	Ibid.
14	Do.	—	Died	Ibid.
15	Do.	3rd month .	Do.	Dubois—'Bull de l'Acad.,' xvii.
16	Primipara	1st month .	Do.	Ibid.
17	—	2nd month .	Do.	Ibid.
18	Primipara	1st and 2nd months	Recovered	Ibid.
19	—	3rd and 4th months	Do.	Harris—'Phil. Med. Exam.'
20	Multipara	6th and 7th months	Do.	Garraway—'Brit. Med. Jour.,' Oct., 1857.
21	Do.	6th and 7th months	Died	Ibid.
22	—	2nd month .	Recovered	Tarnier — Cazeaux' 'Midwifery.'
23	Primipara	2nd month .	Do.	M'Clintock.
24	—	—	Do.	Trousseau—cited by Danyau.
25	—	4th month .	Do.	Lee—'Clin. Mid.,' 107.
26	—	2nd month .	Died	Ibid.
27	—	6th month .	Recovered	Ibid.
28	—	—	Do.	Ibid.
29	Multipara	8th month .	Died	Ibid.
30	Do.	8th month .	Recovered	Barnes—'Lancet,' 1863, Vol. i.
31	Do.	5th month .	Do.	Griolet—cited by Danyau.
32	—	7th month .	Do.	Cited by Danyau.
33	Primipara	3rd month .	Do.	Stoltz—'Gaz. Méd.,' Juin, 1852.
34	Do.	7th month .	Do.	Hardy—'Dub. Quar. Jour.,' xxxviii.
35	Multipara	6th month .	Do.	Campbell—'Brit. Med. Jour.,' Oct., 1872.
36	Do.	2nd to 4th month	Do.	Dr. E. B. Sinclair.
37	—	Do.	Do.	'Gaz. des Hôpit.,' 62, 1873.
38	—	6th month .	Do.	Pallen—'St. Louis' Med. and Surg. Jour.,' Sept. 1873.

The general result of these cases is simply this, that in *twenty-nine* instances the sickness was arrested, and the patients perfectly recovered, whilst in *nine* instances, although the vomiting ceased in nearly every one of them after the expulsion of the ovum, still the patients did not ultimately recover. Whether, or how far, the operation is chargeable for this unfavorable issue can only be estimated by a careful examination into the circumstances of each peculiar case, and the results of such examinations I now beg briefly to submit. In case No. 7, related by Churchill, the woman lived four or five days, and then died of diarrhœa, apparently brought on by over-feeding. In case No. 14, recorded by Burns, a biliary calculus was found impacted in the gall duct, which, no doubt, was the cause of the vomiting, and not pregnancy. Case No. 17 was in the practice of Dubois, who states that the woman survived until the sixteenth day after abortion, and then died of puerperal fever. No. 21 died on the tenth day after delivery, the cause being, as Mr. Garraway, who relates it, says, "sheer debility." The same patient suffered to such an extreme degree from sickness in her previous pregnancy, that Mr. Garraway had to provoke parturition as the only chance of saving her life. She recovered, but her constitution was permanently and greatly weakened by the prolonged vomiting. No. 29 died of post-partum hæmorrhage: the case is recorded by Dr. Lee, having been seen by him in consultation. The woman was in the eighth month of her fifth pregnancy, and was greatly emaciated and reduced from long sickness of stomach and previous ill health; consequently she had no strength left to bear up against the effects of the loss. The instant the membranes were punctured the vomiting ceased.

In the *four* remaining fatal cases the operation was resorted to as a forlorn hope, but there were no reasonable grounds for expecting that it could succeed, to such a deplorable state of exhaustion and prostration were the patients reduced by the prolonged and incessant sickness of stomach.

The result, then, of this analysis of the nine fatal cases is in no way disparaging to the operation, since in five of them the unfavorable issue was attributable to the fact of the interposition of art having been too long delayed (and we know that any operation, however good in itself, and however skilfully performed, may fail from the same cause); whilst in the remaining four cases the cause of death was purely accidental, and not directly referable to the operation.

Cases will occasionally be met with where, along with the vomiting, are symptoms which would lead us strongly to suspect the existence of actual disease of the stomach, liver, kidneys, or some other organ. Here a grave question will arise, viz. whether the vomiting be dependent on pregnancy at all or not? These constitute a very perplexing class of cases, and require the practitioner to use the utmost caution and discrimination before deciding on the expediency of inducing labour. In cases of this description one would be inclined, *primâ facie*, to pronounce against its adoption, lest the vomiting might continue, in spite of the uterus being emptied (as I have known to happen), which would, of course, expose the operator to censure, unless in his prognosis he had fully anticipated the possibility of such a contingency, and prepared the friends for it.

In most, if not in all, of these complicated cases, however, the gravid state is itself an important factor of the vomiting, so that cutting short the pregnancy will often tend to remove or most materially alleviate the symptom which menaces the life of the patient. Examples of this are to be found among the cases in the table. Thus, in Dr. Hardy's patient (No. 34) dark fluid was ejected from the stomach, with blood in large quantity, and the burning sensation was intolerable. In the case recorded by Dr. Barnes (No. 30) there were hæmatemesis and scirrhus-like induration of the cervix, which was nodulated, and in my case (No. 23) slight jaundice was present.

Dr. Churchill has favoured me with the notes of a case bearing very closely on this part of our subject, and which I, therefore, make no apology for introducing. He writes:—"I was called to Mrs. W— early in November, and was told that she was between three and four months pregnant of her fifth child. She had always suffered from sickness in her former pregnancies, but never to such an extent as now. Whether she took anything or nothing she was incessantly retching and vomiting. Not a particle of anything rested on her stomach. I found her looking very ill and exhausted, with a pulse of 120 *and dry tongue*. There was no pain on pressure in any part of the abdomen, but I found a considerable enlargement of the liver, with a very weak heart. I tried the usual remedies with some slight alleviation, but it was clear that unless some more decided relief was obtained she would sink. I therefore asked for a consultation, and Dr. Denham agreed with me that the induction of abortion could not be long deferred, but that as there had been

less vomiting during the day (we met in the evening), we might wait until morning, meantime freeing the bowels.

"In the morning I found that a fœtus of near four months, alive, had escaped from the uterus, without any pain or bleeding. The after-birth was retained, but as there was no discharge I determined to let her rest. The vomiting *scarcely* returned after the abortion, but the sinking *increased*, in spite of all our remedies, and she died on the third day after the expulsion of the fœtus, and the seventh from my first visit."

That the vomiting in this case was dependent mainly upon the pregnancy is proved, I think, by its cessation as soon as the fœtus had come away. The death of the patient some hours subsequently well exemplifies the observation of Dubois, that if the symptoms go beyond a certain limit, before abortion occur, this will be productive of no real benefit.

The first great point of practical importance in the cases of excessive vomiting is to make a correct diagnosis, and ascertain beyond all doubt that the sickness really depends on pregnancy, and not on any extraneous cause. Many cases occur where this question is surrounded by difficulties that will tax to the uttermost the diagnostic skill and discrimination of the medical man. This question being cleared up, the next great practical point is to know the exact time to interfere. How long may we trust to medical treatment, and keep on temporising in the hope that a favorable change may take place, or that nature will interpose? Cases have been narrated where, in the last extremity of sickness, nature did interfere, and caused the expulsion of the ovum, but *too late to save the patients' lives;* in fact, this expulsive action of the uterus took place here, as on many other occasions, because the patient was about to die. The development of the symptoms which indicate the approach of danger should, therefore, be carefully looked for, and as soon as this period has arrived no time should be lost in resorting to the only alternative now remaining, which affords the patient a chance for her life.]

SECT. 2.—*Of the Difficulty in making Water; Costiveness; Hæmorrhoids, Swelling of the Legs and Labia Pudendi; and the Dyspnœa and Vomiting at the latter end of Pregnancy.*

Towards the end of the fourth month, or beginning of the fifth, the uterus is so much distended as to fill all the upper part of the pelvis, and then begins to rise upwards into the abdomen; about the same time the os internum is likewise raised and turned backwards towards the sacrum, because the fundus is inclined forwards in its rise. The uterus, according to the different directions in which it extends, produces various complaints by its weight and pressure upon the adjacent parts, whether in the pelvis, or higher in the abdomen. In the fourth or fifth month, it presses against the sphincter of the bladder in the pelvis, and produces a difficulty in making water, and sometimes (though seldom) a total suppression.

[Complete retention is doubtless what is here meant. No mention is made here or elsewhere of retroversion of the gravid uterus as a cause of obstruction to the discharge of the urine; but it must be remembered that the celebrated case which first called the attention of William Hunter, and, through him, that of British accoucheurs, to this form of uterine displacement, did not occur for two years (viz. in the year 1754) after the publication of Smellie's 'Midwifery.'

Curious to say, amongst Smellie's cases is one, No. 88, communicated by Mr. Hengeston, which presents all the characters of retroflexion of the uterus; indeed, from the description given of the symptoms and tangible signs, there can be no doubt upon this point. It does not appear, however, that there was retention of urine. Severe hæmorrhage arising from abortion led to its detection; and the doctor in attendance seems, from the means he took to replace the womb, to have understood, in some degree at all events, the nature of the displacement; but neither he nor Smellie recognised the special and peculiar importance

of the case. The absence of dysuria, under like circumstances, I have often seen in women who had previously been the subjects of this displacement.]

This complaint will happen, if the womb is sunk too low in the vagina; or if the ovum, instead of adhering to the fundus, descends into the wide part in the middle of the neck, which accordingly first undergoes distention. This disposition of the ovum is frequently the cause of abortion, because the mouth and neck being in this case, from the stretching, the weakest parts of the uterus, the os internum begins to be opened too soon, yet sometimes this will continue strong and rigid; and after the neck is enlarged, the fundus will be, last of all, stretched till the end of gestation, and the woman be happily delivered.[1]

But, as the stretching begins lower down in this than in a common case, the uterus must consequently press against all parts of the pelvis before it can rise above the brim; and this pressure sometimes produces an obstruction of urine and difficulty in going to stool: the general compression of all these parts will be attended with a degree of inflammation in the substance of the uterus, the vagina, mouth of the bladder, and rectum; from whence violent pains and a fever will ensue. In order to remove or alleviate these symptoms, recourse must be had to bleeding and glysters, the urine must be drawn off by the catheter, fomentations and warm baths be used, and this method occasionally repeated until the complaints abate; and they commonly vanish in consequence of the womb's rising higher, so as to be supported on the brim of the pelvis. See Cases No. 49, 50, 51, and Tab. VI, f. 2.

By the pressure of the uterus upon the upper part of the rectum and lower part of the colon, where it makes

[1] This is one probable reason to account for the placenta's sometimes adhering over the inside of the mouth of the womb, and helps to support the theory of the neck's turning shorter and shorter as the full time approaches.

semicircular turns to the right and left, the fæces are hindered to pass, and by remaining too long in the guts are indurated, the fluid parts being absorbed. Hence arise violent straining at stool, and a compression of the womb, which threatens abortion. When the patient, therefore, has laboured under this symptom for several days, let emollient, laxative, and gently stimulating glysters be injected. But if the rectum be so obstructed as that the injection cannot pass, suppositories are first to be introduced: for frequently, when the colon and rectum are compressed by the uterus, the peristaltic motion is weakened and impeded, so that the guts cannot expel their contents; in which case, the suppository, by irritation, quickens this faculty, and in dissolving lubricates the parts, thereby facilitating the discharge of the hardened fæces. This previous measure being taken, a glyster ought to be injected, in order to dissolve the collected and indurated contents of the colon, as well as to lubricate and stimulate the inside of that intestine, so as to effect a general evacuation; and for this purpose, a syringe should be used instead of a bladder, that the injection may be thrown up with greater efficacy and force.

[I have seen the rectum distended with such a mass of hardened fæces that suppositories and enemata were utterly useless to effect their removal, the anus being dilated to the size of a florin by the fæcal accumulation within. Here direct mechanical means must be employed to dislodge and extract the scybala with which the gut is blocked up; this having been accomplished, then enemata of turpentine, soap and water, may advantageously be employed to clear out the lower portion of the colon and to stimulate its peristaltic action. Where there is any grounds for suspecting the existencc of this state of things a digital examination of the rectum should be made, as by this way only can we arrive at a knowledge of the full extent of the mischief, and successfully remove it.]

These glysters ought to be repeated until the hardened fæces are altogether brought away, and the last discharge ap-

pear to be of a soft consistence: neither ought the prescriber to trust to the reports of the patients or nurse, but to his own senses, in examining the effects of these injections; for, if the complaint hath continued several days, a large quantity of indurated fæces ought to be discharged. To avoid such inconvenience for the future, an emollient glyster must be injected every second night; or, if the patient will not submit to this method, which is certainly the easiest and best, recourse must be had to those lenients mentioned at the latter end of this section: for when the fæces are long retained, the air rarifies, expands, and stretches the colon, producing severe colic-pains; this being the method followed by nature, with a view to disburthen herself when she is thus encumbered. See Case No. 52, and Tab. VI, f. 2.

The pressure of the uterus upon the hæmorrhoidal and internal iliac veins, produces a turgency and tumefaction of all the parts below, such as the pudenda, vagina, anus, and even the os internum, and neck of the womb. This tumefaction of the hæmorrhoidal veins, appears in those swellings at the inside and outside of the anus, which are known by name of the external and internal hæmorrhoids, or piles. This is a complaint to which women are naturally more subject than the other sex: but it is always more violent in time of pregnancy, when the same method of cure may be administered as that practised at other times, though greater caution must be used in applying leeches to the parts; because, in this case, a great quantity of blood may be lost before the discharge can be restrained. See Collect. X.

[This is a very needful caution about the use of leeches during pregnancy; nevertheless, in bad cases of piles I have found nothing to give such prompt and decided relief as the application of two or three leeches to the parts, nor has any difficulty been experienced in stopping the discharge of blood from the bites.]

About the latter end of the fifth or in the beginning of the sixth month, the uterus being stretched above the brim, and the fundus raised to the middle space betwixt the os pubis and navel, is considerably increased in weight; and even then (though much more so near the full time) lies heavy upon the upper part of the brim, presses upon the vertebræ of the loins and ossa ilia, and, rising still higher with an augmented force, gradually stretches the parietes of the abdomen, pushing the intestines upwards and to each side.

The weight and pressure on the external iliac veins are attended with a surcharge or fullness in the returning vessels that come from the feet, legs, and thighs; and this tumefaction produces œdematous and inflammatory swellings in these parts, together with varicose tumours in the veins, that sometimes come to suppuration.

The same weight and pressure occasion pains in the back, belly, and loins, especially towards the end of the eighth or in the ninth month: if the uterus rises too high, a dispnœa or difficulty of breathing, and frequent vomitings, ensue: the first proceeds from the confinement of the lungs and diaphragm in respiration, the liver and viscera of the abdomen being forced up into the thorax; and the last is occasioned by the extraordinary pressure upon the stomach. See Case No. 55, &c.

[Mr. Roberton has described (*op. cit.*, p. 451) a pain of the right side in pregnancy, which is very obscure as to its cause and very rebellious to treatment. "Some complain as though a knife were stuck into the part, or pins were being pushed into it; others, as if something internally stuck to the affected part; others, again, describe it as a cutting pain, and some as a teasing and stinging pain; and there is generally a sense of burning heat; in none is the pain aggravated by pressure. Several have complained of the movements of the child at the *site of the pain* as the principal cause of their suffering. Almost always the patient says she is worst in the afternoon, or towards the evening or in the night;

that the pain is aggravated by sitting down; above all, by lying in bed on the right side or on the back. She is obliged to lie on the left side; and I have known some who, in the afterpart of the day, had no ease unless when leaning the body towards the left. In a majority of instances the child is felt by the patient to lie more on the right than the left side of the abdomen. There is commonly constipation of the bowels, and, with few exceptions, the motions are black." He tried various plans of treatment, but derived most benefit (and that of a partial kind only) from small bleeding, if there was feverishness, followed by mercurials and purgatives. In my own experience I found the use of cholagogues and aperients, together with the daily use of a strong anodyne embrocation over the seat of pain, to exercise a decidedly beneficial influence. In severe attacks of the pain dry cupping has been used with good effect. Mr. Roberton is of opinion that the cause of this pain is the upward pressure of the enlarged uterus upon the liver. I am inclined to think that pressure on the colon has also a good deal to say to it; ease is always felt, he remarks, by those positions which tend to carry the uterine tumour away from the liver.]

All the complaints above described, namely, swelling of the legs, thighs, and labia pudendi, pains in the back, loins, and belly, with dyspnœa and vomiting, are removed or palliated by the following method. The patient, if she can bear such evacuations, is generally relieved by bleeding at the arm or ankle, to the amount of eight or ten ounces; but the quantity must be proportioned to the emergency of the case: the belly must be kept open and easy with emollient glysters and laxative medicines; such as a spoonful or two of a mixture composed of equal parts of *Ol. Amygd. d.* and *Syr. Violar.* taken every night; or from two drachms to half an ounce of manna, or the same quantity of lenitive electuary; a small dose of rhubarb, or five grains of any opening pill, unless the patient be troubled with the hæmorrhoids, in which case all aloetic medicines ought to be avoided: the patient must not walk much, or undergo hard exercise; but frequently rest upon the bed, and lie longer than usual in the morning. When the

swelling of the legs is moderate, and only returns at night, rollers or the laced stocking may be serviceable ; but when it extends in a great degree to the thighs, labia pudendi, and lower part of the belly, in a woman of a full habit of body, venæsection is necessary, because this œdematous swelling proceeds from a compression of the returning veins, and not from laxity, as in the anasarca and leucophlegmatic constitutions: here moderate exercise, and (as I have already observed) frequent resting on a bed or couch, is beneficial; or if the skin of the leg and pudenda is excessively stretched, so as to be violently pained, the patient will be greatly relieved by puncturing the parts occasionally: but these complaints cannot be totally removed till delivery, after which they commonly vanish of themselves.

[In every case of anasarca in pregnancy the urine should be carefully examined, with a view to see if it contain albumen. The appearance of any œdematous swelling, however slight, in the hands or face should be regarded as a premonitory symptom of eclampsia; whereas, an extreme degree of swelling confined to the lower extremities is more apt to be one of the simply mechanical effects of pregnancy. In twin pregnancy this œdematous swelling is sometimes very great, causing much inconvenience and discomfort to the patient.]

The bellies of those that are indolent and use no exercise ought to be moderately compressed, so that the uterus may not rise too high, and occasion difficulty in breathing, and vomiting, in the last months; but they must not be too straitly swathed lest the womb should be determined, in stretching over the pubes, and produce a pendulous belly, which is often the cause of difficult labours. A medium ought, therefore, to be preserved in this article of compressing, and no woman lace her jumps or stays so as to make herself uneasy; while the diet, air, and exercise, ought to be regulated according to the constitution, custom, and complaints of the patient.

CHAPTER II.

DISEASES INCIDENT TO PREGNANT WOMEN.

SECT. I.—*Of the Stone in the Kidneys and Bladder.*

WOMEN are frequently afflicted with small stones and gravel in the kidneys, being less subject than men to this complaint in the bladder, because their urethras are short and wide, and suffer the calculous concretions to pass with the urine more easily.

In pregnancy, it is often difficult to distinguish gravelly pains from those that are felt in the small of the back and loins proceeding from the pressure of the uterus upon these parts. In both cases, when the pains are violent, the urine is high-coloured; and the difference is, that in the gravel a quantity of sand generally falls to the bottom: though the sediment commonly deposited by high-coloured urine is often mistaken for gravel; a mistake, however, which is the less material, because both complaints are relieved by the same method, namely, venæsection, emollient glysters, emulsions, with gum arabic, infusions of *althea*, *sem. lini*, and opiates, and an application of *emplast. roborans* to the back.

Pains in the loins and belly, extending to the false ribs, occasioned by the stretching of the uterus, are eased by rubbing and anointing the parts every night before the fire, with emollient unguents, such as that of *althea*, &c.

In pregnant women, the complaints from a stone in the bladder (which is sometimes, though seldom, the case) are to be treated in the same manner as at any other time; except that, when the patient is near delivery, it is not advisable to endeavour to extract it, lest the operation should be attended with an inflammation of the urethra

and vagina. If therefore the stone should be rough, angular, or surrounded with sharp prickles, the woman suffers greatly from the pressure of the uterus upon the bladder, especially in time of labour, when the membranes are broke, and the head of the child is pushed into the upper part of the pelvis; because the stone is then pressed before it, upon the neck of the bladder, so as to occasion exquisite torture, and infallibly retard the labour-pains. If the stone hath descended into the meatus urinarius, perhaps it may be easily extracted: but if it still remains within the bladder, the only way of relieving the patient is by introducing a catheter, also one or two fingers in the vagina, to push up the stone above and behind the head of the child; or, if this cannot be done, to turn and deliver by the feet, before the head is pressed too far down into the pelvis. See Cases Nos. 59, 60, 61.

Sect. 2.—*Of Hernias, or Ruptures.*

Women are also afflicted with ruptures in different parts, such as the navel, groin, and pelvis: but, as the uterus in time of gestation stretches higher and higher, the omentum and intestines are pressed more and more upward and to each side; and about the fifth or six month, the womb rises so high, that the intestine cannot descend into the groin, and the rupture in that part ceases for the present. About the eighth month, the uterus is so high advanced, that the intestine or epiploon is kept from pushing out at the navel, consequently the umbilical hernia is likewise suspended till after delivery; but this will not happen in either case unless the rupture be of that kind which suffers the omentum and intestine to be easily reduced.

Women are chiefly subject to ruptures of the umbilicus, and those of the groin most incident to the other sex; but there is a third kind peculiar to women, though it rarely

happens even in them: this is produced from the intestine falling down betwixt the back part of the uterus and vagina, and the fore part of the rectum. The peritonæum descends much lower in this place than at the anterior descent, where it covers the upper part of the bladder, or at the sides of the pelvis, where it forms the ligamenta lata; for it reaches to within one or two inches of the perinæum; and the intestines pressing it farther down, or bursting it in this part, are pushed out in the form of a large tumour, at the side of the perinæum, betwixt the lower part of the ischium and coccyx. The gut being so situated in time of labour, when the child's head is squeezed into the pelvis, may suffer strangulation, if the case should prove lingering and tedious, and the pressure continue for any length of time. In order to prevent or remedy this accident, let the os externum be gradually opened with the hand, which being introduced in the vagina, should raise the child's head, so as to suffer the intestine to be pushed above it, by the assistance of the other hand, which presses upon the outside: in this manner, both hands may be used alternately, till the purpose be effected; or, should this method fail to reduce and retain the intestine, the child must be delivered with the forceps, or turned and brought by the feet, as we have directed in the case of a stone in the bladder. The ruptures of the umbilicus and groin may be restrained and kept up by proper compression, but it is very difficult to contrive an effectual bandage for the descent in the perinæum. See Cases Nos. 62, 63, 64 et seq.

[The occurrence of intestinal hernia in the advanced period of pregnancy is extremely rare. I have hardly ever met with an instance in my own experience, and never with one to cause any trouble. Its rarity at this time may in great measure be accounted for by the anterior position which the gravid uterus occupies in the abdomen, whereby the bowels and omentum are pushed away from the openings through which their accidental protrusion could ordinarily take place.

Smellie notices here that very rare form of rupture, which Sir Astley Cooper describes under the appropriate name of *perineal hernia;* but he is wrong in saying it is peculiar to women. The plate which Cooper gives to illustrate the anatomy of this form of hernia was taken from a male subject, and he quotes another case from Mr. Bromfield's 'Chirurgical Observations,' where the subject was also of the male sex. It is evident, I think, that some cases referred to by Cooper—*i. e.* those of Dr. Marcet, Dr. Sims, and Dr. Haighton—were not cases of hernia at all, but merely examples of obstruction of the rectum by the pressure of a retroflexed uterus, or of some tumour connected therewith. An example of perineal hernia in a woman came under my observation very lately. The woman was not pregnant at the time of my seeing her, but she had borne two or three children. The swelling occasioned by the hernia in the perineal region was very slight, but could readily be felt with the finger in the vagina, and was easily reducible, spontaneously receding when she lay recumbent. She was a labourer's wife, and this ailment caused her a great deal of annoyance when she was up and going about. Case *66* is an instance of perineal hernia, and is quoted by Cooper to show that this form of hernia may sometimes prove dangerous in the progress of gestation.]

Sect. 3.—*Of Dropsies.*

Difficulty in breathing, in pregnant women, may be occasioned by collections of matter in the chest or thorax, as well as in the abdomen, from abscesses in the viseera, co-operating with the pressure of the uterus upon the organs of respiration: these complaints (which are generally fatal) must be treated by the same method in pregnancy which is used at other times. The cavity of the abdomen is also subjeet to an ascites or dropsy, with or without hydatides, which, in conjunction with the stretehing uterus, may distend the belly to a prodigious size, producing great oppression and anxiety. Here, too, the common method of curing or palliating dropsies must be used; with this difference, that the purging medicines are to be cautiously preseribed. See Cases Nos. *68*, *69*.

But this disorder is not so incident to pregnant women, as the anasarca; which is a dropsy of the cellular membrane, that extends over the whole surface of the body, enveloping every individual muscle, vessel, and fibre. This disease is the effect of universal laxity and weakness, and, if not timely obviated, may endanger the patient's life, being sometimes attended with a fatal rupture of the uterus in time of labour: in order to prevent which catastrophe, everything ought to be prescribed in point of diet, medicine, and exercise, which may contribute to strengthen the solids and quicken the circulation. Let her, for example, take repeated doses of the *confect. cardiac.*, drink moderate quantities of strong wine, in which the warm spices have been infused, eat no meat but such as is roasted and high-seasoned, and abstain altogether from weak diluting fluids, such as small beer and water.

[General anasarca in women of broken-down cachectic constitution, and who have borne many children, is sometimes met with, and requires to be treated on the tonic plan here pointed out; but I would not look on this state of things as indicating any special predisposition to rupture of the uterus.]

Sect. 4.—*Of Incontinence of Urine and Difficulty in making Water, at the latter end of Pregnancy, and in time of Labour.*

The vesica urinaria, in pregnant women near their full time, is often so much pressed by the uterus, that it will contain but a very small quantity of water, a circumstance, though not dangerous, extremely troublesome, especially when attended with a vomiting or cough; in which case, the straining forces out the water involuntarily, with great violence. The cough may be alleviated by proper remedies, but the vomiting can seldom be removed. Sometimes a bandage applied round the lower part of the belly, and

supported with the scapular, is of singular service, particularly when the uterus lies pendulous over the os pubis, thereby compressing the urinary bladder.

But this complaint is not of such dangerous consequence as a difficulty in making water, or a total suppression which (as we have already observed) happens, though very seldom, in the fourth or in the beginning of the fifth month of pregnancy; but most frequently occurs in the time of labour, and after delivery. In the beginning of labour, before the membranes are broke, and the head of the child sunk into the passage, the woman commonly labours under an incontinence of urine from the pressure upon the bladder, but the membranes being broken, and the waters discharged, the uterus contracts, and the child's head is forced down into the pelvis, where, if it continues for any length of time, the urethra and sphincter vesicæ are so compressed that the urine cannot pass; while the pressure on the other parts of the bladder being removed in consequence of the diminished size of the uterus and the laxity of the parietes of the abdomen, the vesica urinaria is the more easily stretched by the increasing quantity of urine, which distends it to such a degree, that the fibres are overstrained; and after delivery, when the pressure is removed from the sphincter and meatus urinarius, it cannot contract so as to discharge its contents, especially if any swelling or inflammation remains from the pressure upon the neck and urethra, in which case, the patient is afflicted with violent stretching pains in the loins, back, groin, and particularly above the os pubis.

This complaint is immediately removed by drawing off the urine with a catheter; and indeed this expedient ought to be tried before delivery, as it must infallibly promote labour, because one pain interferes with the other. If the inflammation continues or increases, and the obstruction of urine recurs after delivery, the external parts ought to be

fomented with warm stupes; bladders half filled with warm water or emollient decoctions may be applied, as hot as the patient can bear them, to all the lower part of the belly; and the catheter be used twice a day, or as often as necessity requires, until the bladder shall have recovered its tone, so as to perform its office without assistance.

[A gum-elastic male catheter of about No. 10 or No. 12 size, is generally the most convenient instrument to use, and the patient lying on her left side with thighs well drawn up, is always, and for every reason, the best position in which she could be placed. The chief difficulty in catheterism of the female is to find the meatus of the urethra, in catheterism of males to find an entrance into the bladder.

Where the catheter is required after delivery, it will save the patient some annoyance to guide it by sight, and not by touch; into the orifice of the urethra, as the parts are more or less swollen and tender at this time. For the removal of the atony of the bladder occasionally following upon labour, I have found the administration of ergot of rye to be very beneficial. It may be given in doses of half a drachm to a drachm, of the fluid extract of the pharmacopœia; or somewhat smaller doses of Long's extract (made with glycerine, and manufactured by Messrs. Hamilton, Long and Co., of Dublin), which I have found a very certain and active preparation of the drug.

I always direct my patients to try and relieve the bladder within six hours after delivery; and if they cannot succeed on the back, to try the position on elbows and knees.]

Sect. 5.—*Of the Fluor Albus in Pregnant Women.*

This discharge, to which women are more subject at other times than during uterine gestation, if in a large quantity, may hinder conception. In those who are usually troubled with it, the complaint generally ceases all the time of pregnancy: in some, however, it continues to the last, provided the seat of it is in the vagina: and the evacuation is sometimes so great as to weaken both mother and child,

and even to produce a miscarriage. Everything that strengthens and nourishes the body is here of service. This is also supposed to happen when, some part of the chorion being separated from the uterus, the fluid that is separated by the colatura lactea for the nutrition of the fœtus forces its way through the os internum; and the greater this separation is, and the nearer the full time, the larger the discharge will be.

Sect. 6.—*Of the Gonorrhœa and Lues Venerea.*

Though women are not so soon infected with this distemper as men, they are commonly cured with greater difficulty, because of the great moisture and laxity of the parts affected; especially in pregnant women, who nevertheless are to be treated in the same method as practised at other times, except that in this case mercurials and cathartics ought to be very cautiously used; for if the gonorrhœa be neglected or unskilfully managed, the virus will increase, and actually degenerate into a confirmed pox. It is often difficult to distinguish a gonorrhœa from the fluor albus, because the colour and quantity of the discharge is nearly the same in both: in the last, however, we seldom meet with inflammation or ulcers within the labia or entrance of the vagina; whereas in the first, these generally appear, soon after the infection, about the meatus urinarius, the carunculæ myrtiformes, and inside of the labia, producing a violent pain in making water. The gonorrhœa is likewise distinguished from the fluor albus by its continuing all the time of the menstrual discharge, during which the other complaint is commonly suspended; but this mark is at best uncertain, and can be of no service in pregnancy, because then the menses themselves are obstructed. The cure is best attained by bleeding; repeated doses of gentle cathartics, mixed with mercurials; a low diet; emulsions

impregnated with nitre; and lastly, balsamic, strengthening, and astringent medicines.

If the distemper hath proceeded to an inveterate degree of the second infection, attended with cancerous ulcerations of the pudenda, buboes in the groin, ulcers in the nose and throat, so that the life of the patient or constitution of the parts are endangered, mercurials must be given, so as to raise a gentle degree of salivation; which ought to be immediately restrained, and even carried off, by mild purgatives, and renewed occasionally, according to the strength of the woman, until the virus be utterly discharged. Here, however, a great deal must depend upon the judgment and discretion of the prescriber, who, rather than propose anything that might occasion abortion, ought to try, by palliating medicines, to alleviate and keep under the symptoms till after delivery. See Case 70.

CHAPTER III.

Of Miscarriages.

Most of the complaints above described, if violent and neglected, may occasion a miscarriage; and it would be almost an endless task to enumerate every accident from which this misfortune may proceed. I shall therefore content myself with describing in what manner abortion happens; first, in the death of the child; secondly, in the separation of the placenta; and lastly, in whatever may occasion too great extension of the neck and of the os internum.

Sect. 1.—*Of the Child's Death.*

This may proceed from diseases peculiar to itself not to be accounted for, as well as from divers accidents that befall it in the womb. If, for example, the navel-string be long, and the quantity of surrounding waters great, the fœtus, while young, may in swimming form a noose of the funis; through which if the head only passes, a circumvolution will happen round the neck or body; but should the whole fœtus pass or thread this noose, a knot will be formed on the navel-string, which, if tight drawn, will absolutely obstruct the circulation. This may likewise be the case when the waters are in very small quantity, and the funis umbilicalis falls down before the head, by which it is violently compressed. In short, the death of the fœtus will be effected by all circumvolutions, knots, or pressure upon the navel-string, which destroy the circulation betwixt the placenta and the child. See Cases 71, 72, 73, and 74.

[No doubt the death of the fœtus will be effected if the circulation between the placenta and child be destroyed; and one might, *à priori*, be disposed to think that fatal interruption of the funic circulation should be very common. But such an inference does not receive support from the results of observation. I have repeatedly seen live children born with knots on the funis, and never but once or twice seen a knot on the cord of a dead-born fœtus. I have on many occasions heard the funic souffle during labour, and yet the children were born alive. The production of the sound in question I believe to be due to the compression of the cord between the uterus and some part of the body (generally the back) of the fœtus, and partially to the pressure of the stethoscope. I have certainly seen children who were destroyed by circumvolutions of the funis round the neck, before the accession of labour. One such case occurred to me quite recently, where, as in Smellie's case, No. 74, the cord made three circles round the neck, and the child was born dead and putrid.

The treatment to be adopted in order to prevent the death of the fœtus in utero, where this is due to maternal influence, is a very important consideration. In cases where it is not directly traceable to a syphiltic taint in either parent, I place more confidence in the prolonged daily use of chlorate of potash and tincture of the perchloride of iron than any other remedy I am acquainted with. Its employment must be commenced some weeks before the period at which the death of the fœtus is likely to occur, (as shown by the history of the woman's previous pregnancies), and be continued up to the time of labour. The last case in which I pursued this treatment was a very remarkable one.

The lady was the wife of a medical man, and had had eight still-born children, most of them being premature; and one child which, though born alive, only survived its birth a few minutes. For nearly three months I kept her using this medicine, and the result was she went to the full time and gave birth to a living male child, which is now, at time I write, a thriving infant of eight months old.]

The fœtus may suffer death from diseases and accidents that happen to the mother; from violent passions of joy, fear, or anger, suddenly raised to such transports as occasion tremors, fainting, or convulsions; and from a plethora, and all acute distempers in which the circulating force of the fluids is too violent. See Case 75.

The child being dead, and the circulation in the secundines consequently destroyed, the uterus is no longer stretched; the fœtus, if large, is no longer felt to move or stir; all the contained parts run gradually into a state of putrefaction; the resistance of the membranes becomes weaker than the contracting force of the uterus, joined with the pressure of the contents and parietes of the abdomen; the contained waters of consequence burst through their mortified inclosure; and the uterus is contracted close to its contents, which are therefore pressed down lower and lower; the neck and mouth of the womb being gradually stretched, labour comes on, and a miscarriage ensues.

At other times, gripings, looseness, and labour pains, even before the membranes break, are occasioned by

obstruction or resistance of the vessels of the uterus. In these cases, if no flooding happens, the woman is seldom in danger; and, though the child is known to be dead, the progress of nature is to be waited for with patience. If the woman is weak, exhausted, or timorous, she must be encouraged and fortified with nourishing diet: if plethoric, she must undergo evacuation by bleeding and laxative medicines; and when labour begins, be assisted according to the directions specified in the sequel. See Case 71, et seq.

Sect. 2.—*Of the separation of the Placenta from the Uterus.*

This separation may proceed from all the foregoing diseases and accidents that happen to the mother; from violent shocks, strains, over-reachings, falls, and bruises on the abdomen; as also from vehement coughs, vomitings, or strainings at stool when the body is costive. The separation of the placenta is always accompanied with a discharge of blood from the vessels of the uterus, more or less, according to the term of pregnancy, or as the placenta is more or less detached.

This discharge is distinguished from the menses by the irregularity of its period, by its flowing in a larger quantity, and, after a small intermission, its return upon the least motion of the patient.

The younger the woman is with child, the danger is the less; because though a considerable quantity of blood be lost, it does not flow with such violence as to exhaust her immediately; and therefore she may be supported and her spirits kept up with proper cordials and nutritive diet. But when such an hæmorrhagy happens in any of the three or four last months of pregnancy, the danger is much more imminent, especially towards the full time; because

the vessels of the uterus being then largely distended, a much greater quantity of blood is lost in a shorter time: yet in both cases, the floodings will be more or less, as there is more or less of the placenta separated from the womb; and when this happens in a very small degree, the discharge may, by right management, be sometimes stopped, and everything will happily proceed to the full time. But if this purpose cannot be effected in a woman young with child, the principal intention ought to be a mitigation of the hæmorrhagy, leaving the rest to time and patience, as a miscarriage in the first five months is seldom attended with hazard. On the contrary, nothing can be more dangerous than such an effusion in any of the four last months, provided it cannot be immediately restrained. In this case we are often deceived by a short intermission, occasioned by coagulated blood that locks up the mouth of the womb, which being pushed off, the flooding returns: and hence we account for its returning so commonly upon motion, a fit of coughing, straining at stool, or any effort whatever.

It is happy for the woman in this case when she is so near the full time that she may be sustained till labour is brought on; and this may be promoted, if the head presents, by gently stretching the mouth of the womb, which being sufficiently opened, the membranes must be broke: so that the waters being evacuated, the uterus contracts, the flooding is restrained, and the patient safely delivered. At any rate, if the hæmorrhagy returns again with great violence, there is no other remedy than that of delivering with all expedition according to the method described in Book III, chap. iv, sect. 3, Numb. 3.

Although the great danger is from floodings when near the full time, yet, if labour can be brought on, the os uteri is easily dilated with the labour or the hand; but in the sixth or seventh month it takes longer time, and is stretched

with greater difficulty, which is sometimes the occasion of the danger at that period.

The edge or middle of the placenta sometimes adheres over the inside of the os internum, which frequently begins to open several weeks before the full time; and if this be the case, a flooding begins at the same time, and seldom ceases entirely until the woman is delivered: the discharge may indeed be intermitted by coagulums that stop up the passage; but when these are removed, it returns with its former violence, and demands the same treatment that is recommended above.

In all cases and at all times of pregnancy, if the woman receives any extraordinary shock either in mind or body; if she is attacked by a violent fever, or any complaints attending a plethora; bleeding ought always to be prescribed by way of prevention or precaution, unless a low, weak, lax habit of body renders such evacuation unadvisable; but these are not so subject to fevers from fulness.

On the first appearance of flooding, the patient ought immediately to be blooded to the amount of eight or twelve ounces, and venæ-section repeated occasionally according to the strength of the constitution and emergency of the case. She ought to be confined to her bed, and be rather cool than warm. If costive, an emollient glyster must be injected in order to dissolve the hardened fæces, that they may be expelled easily without straining: internally, emulsion with nitre must be used, and mixtures of the *Tinct. Rosar. Rub.* acidulated with spirits of vitriol, as the cooling or restringent method shall seem to be indicated; but above all things, opiates must be administered to procure rest, and quiet the uneasy apprehensions of the mind. For diet, let her use panada, weak broth, and rice-gruel; she may drink water, in which a red-hot iron has been several times quenched, mixed with a small proportion of red burnt wine; she must abstain from all the high-seasoned

foods, and even flesh-meat or strong broths, that will inrich the blood too fast, and quicken the circulation. But if, notwithstanding this regimen, the flooding shall continue and increase, so that the patient becomes faint and low with loss of blood; we must without further delay attempt to deliver her, as in Book III, chap. iv, sect. 3, though this is seldom practicable, except in the last months of pregnancy, and then will be the easier performed the nearer she is to her full time, unless labour-pains shall have assisted or begun a dilatation of the os internum. (See also Collect. XVIII and XXXIII.

[The subject of hæmorrhage in the latter half of pregnancy is further treated of in Book III, chap. iv.

Although Smellie here speaks only cursorily of rupturing the membranes, and not at all of the vaginal plug, as auxiliaries in the treatment of hæmorrhage from the gravid uterus, yet other parts of his work will show that he was well acquainted with their use. In the course of his remarks upon case No. 326 (which occurred to him in 1733 whilst he was at Lanark), we find this candid admission: "At this period of my practice I did not know that applying styptics in the vagina and filling it up with dossils of lint, would sometimes restrain the flooding and assist to bring on labour; neither did I know that the breaking of the membranes, to allow the discharge of the waters, was of use to restrain the floodings by allowing the uterus to contract close to the contained embryo or fœtus." And in case No. 79 (occurring in year 1750) he says, "As the danger seemed pressing, and all the common methods had been tried without success, I took the hint from Hoffman and stuffed the vagina tight with fine tow dipped in oxycrate (*vinegar and water*), which immediately stopped the discharge." The author's observations on uterine hæmorrhage (as well as on many other important subjects) are not confined to one place, but lie scattered in different parts of the work, many of them appearing as clinical observations appended to the cases: but by the aid of the index the reader can, if he choose, refer to these passages at once.

It must I think be admitted that Smellie did not appreciate at its full value the use of the tampon. For controlling the hæmorrhage that accompanies or follows abortion there is no means

so effectual, except the removal of the entire ovum from the uterus, where this is practicable. The plug not only mechanically arrests the escape of blood, but it induces expulsive contractions of the uterus; so that it often happens when we come to remove the plug we find the ovum immediately above it, expelled from the uterine cavity: but for this very reason the plug should not be resorted to, until all hope of averting miscarriage is abandoned, or until the arrest of the hæmorrhage by other measures have failed; and when things have come to this, abortion may be considered inevitable. Sponge and cotton are the two materials generally used for plugging the vagina. The former, perhaps, makes the more efficient plug, but cannot be left long in the passage, as it gets so horribly offensive. The cotton is what I have generally employed, and by using long strips of sheet or French wadding (as it is called), it can be readily introduced and removed: but the blood sometimes finds a passage between the plug and the vaginal wall; and thus the great object of the plugging is defeated. This kind of tampon I have left in for twenty-four, forty-eight, and even sixty hours, without inconvenience. Whatever material be employed—and I really do not think it matters much, provided the vagina be tightly packed with it—the use of a speculum will greatly facilitate the introduction of the plug, and prevent all the pain and annoyance otherwise attendant upon the operation.

Smellie was alive to the importance of removing from the uterus the placenta, or portions of the ovum, which by their presence may keep up hæmorrhage for a length of time; and he narrates a case (No. 87) where at the end of three months from the time of miscarriage he extracted with his fingers, aided by a blunt hook, the placenta of a five months' fœtus which had been retained, and been keeping up hæmorrhage, all that time.

The subject of retentions of this kind, as sequelæ of abortion, has engaged the particular attention of Dr. Matthews Duncan, and he gives an excellent chapter upon it in his 'Researches in Obstetrics,' p. 274, wherein he points out the grounds of diagnosis and the best mode of extracting the foreign substance.

The entire ovum, after the embryo has been blighted, is sometimes retained for a considerable period, giving rise to irregular hæmorrhagic discharges, and causing very great anxiety and annoyance to the patient. Cases of this kind also have been alluded to by Dr. Duncan in his paper just mentioned. Apart from their purely

obstetrical aspect, these cases have another source of interest for us arising out of the moral and medico-legal questions which they may give rise to, and which the accoucheur should be prepared to answer. Hence they constitute altogether a very important class of cases.

As a general rule we find that when the embryo perishes in utero its expulsion takes place soon afterwards—that is to say, within some hours or days. To this general rule there are many exceptions, and these form a group of very troublesome, perplexing cases, severely testing the patience and diagnostic skill of the practitioner. Very often the patient had, at some time subsequent to conception, symptoms of miscarriage, and is under the impression that such actually did take place, though positive evidence in support of this is wanting. On other occasions, however, I have known a patient to assert, with great pertinacity, that she still carried the fruit of conception, notwithstanding that every symptom of pregnancy had ceased, and that there was a strong presumption of her having aborted; yet the result proved *her* to be correct. Hence, I would not altogether shut my ears to the earnest representations of the patient on the point before us.

That a blighted ovum may be retained in the uterus for many months is a well-established fact, and one that should never be forgotten. Dr. Granville, in his 'Illustrations of Abortion,' delineates an ovum, belonging to Sir Charles M. Clarke's collection, which was expelled at $4\frac{1}{2}$ months of gestation, but yet the embryo had only the development, he says, of "scarcely more than a few weeks' growth."

A lady who menstruated in the last week of July began about the middle of August to exhibit unequivocal symptoms of pregnancy, which proceeded regularly till the middle of October, when indications of threatened abortion appeared, with pain, and the repeated expulsion of large coagula, and substances of various appearances. After this the previously existing symptoms of pregnancy entirely disappeared, and it was supposed that miscarriage had occurred, and that the ovum had escaped unnoticed amidst the masses of coagula. The lady resumed her ordinary habits, and went into society as usual without experiencing any uneasiness or unhealthy symptom, except irregular uterine discharges, which was supposed to be menstrual. So matters proceeded until the 7th January (that is, five months from impregnation), when after a long drive she was seized with periodic pains, accompanied by smart uterine hæmorrhage, in consequence of which Dr. Montgomery (who relates the case) was sent

for. He found the os uteri open, and an ovum partly protruded through it; this he succeeded in disengaging and bringing away. On examination it presented the general appearances as to size, form, and growth of the fœtus, of an ovum of less than two months. Cases of a like kind to this are recorded by Velpeau, Gooch, Matthews Duncan, and others—indeed, every accoucheur in large practice must have met with examples. In the following case the ovum was retained for nearly seven months from the probable date of its vitality having been arrested. I saw the lady at Bray, in January, 1870, in consultation with Dr. Raverty, junior. She was the mother of four children, and considered herself to be eight months advanced in pregnancy. She had quickened at the usual time, she said, and thought she felt fœtal movements up to quite a recent period. For some months back she had been frequently troubled with slight sanguineous discharges from the vagina, which had been a cause of much alarm. At the time of my visit, and for some days previously, there was a bloody discharge, and she had a dry tongue, rapid pulse, occasional rigors, and other symptoms of a febrile kind. On examination, I could not discover any symptom of pregnancy except this, that the abdomen was considerably enlarged, but it was everywhere resonant on percussion. On making a vaginal examination I found sticking in the os uteri a small ovum, which I was fortunate enough to detach and get away. It was about the bulk of a walnut, quite putrid, and contained an embryo the size of a common house-fly. I conclude, therefore, that this ovum had been carried in the uterus for close on seven months after its vitality ceased. As the vaginal discharge had not become fœtid until within the last few days, we may suppose that the ovum did not become putrid until its partial extrusion from the uterine cavity. This lady recovered, and had two children subsequently.

A case occurred in the experience of Dr. Ingleby where the embryo perished, and the ovum became "devitalised" (to use the expression of Davis) at the third month of gestation, and was not thrown off till the full term of nine months.

How long the ovum may be retained in the uterine cavity, after its vitality has ceased, is a question that interests the practitioner, the pathologist, and the medical jurist. My own experience and researches upon this point tend to show that the ninth month of the pregnancy is the outside limit of retention of the blighted fruit of conception. This would seem to be the opinion of Dr. Rams-

botham also; and I have not met with any well-authenticated instance, in modern authors, where this period was overpassed, except two cases mentioned by Velpeau. Whilst making this statement, which I believe to be consonant with facts, I must, at the same time, add that I do not see any reason, *à priori*, why an early ovum should not be retained beyond the nine months, when a fœtus dying near the full time may be carried much beyond the ordinary period of gestation, as shown by the cases recorded by myself and Dr. Oldham, under the designation of "missed labour."

It is not possible, I believe, to pronounce, with any degree of certainty, from the appearances of the ovum, how long it had been carried *in utero* after being blighted. In one case the lapse of a few weeks will suffice to produce the same alterations as are met with in another case after the lapse of as many months. Here our knowledge is at fault, and, therefore, in every particular instance it behoves us to speak reservedly as to the duration of the pregnancy, for fear of implicating our own or the patient's character. This introduces to us another and very important aspect—namely, a moral or medico-legal one—under which may be regarded the class of cases we have been considering. Dr. Montgomery has not failed to recognise their importance, viewed from this point of view, and gives striking cases in illustration, one of which I shall cite:—"A lady was married in the month of March; menstruated up to June, and not after. In September her husband went abroad, leaving her, as was supposed, in the third month of pregnancy, of which she had all the symptoms. On the 4th November, and again on the 2nd December, she had some sanguineous discharge, which was looked on as a return of the catamenia, and it was now concluded she was not pregnant, but irregular. These discharges, however, did not recur until the middle of March of the following year—that is, nine months after the last regular menstruation, when an ovum was discharged of apparently two and a half months' development, the consequence of which was a conviction, on the part of some members of her family, highly derogatory to her fair fame. However, before proceeding any further, the ovum was fortunately shown to a judicious medical friend, who, wishing to have his own judgment fortified by the opinion of another, submitted the ovum to me for examination, and the real nature of the case appeared at once manifest. . . . Of the true history of the case there seemed to me no doubt. The lady had conceived,

in all probability, soon after the last regular menstruation in June; and about the time of her husband's departure in September the ovum was blighted, and miscarriage was threatened in November, and again in December, but did not take place; and the blighted ovum having lost its vitality and uterine connexion, ceased to grow but was retained in utero until the ninth month from the time of conception, when it was expelled."

In any case similar to that just related, if the practitioner, failing to interpret aright its real nature, should found his opinion as to the date of conception merely upon the degree of development or size of the ovum, it is obvious he would make a great mistake, and one that might entail very serious and unpleasant consequences to himself and to the patient. In every case, then, where our opinion is asked for as to the age of an ovum, it is a wise and safe rule to qualify our reply by saying *that at the time its vitality* ceased *it was* of such and such an age. We should carefully abstain from intimating how long she may have been pregnant, and thus we avoid all reference to the date of conception, which, in disputed cases, is really the delicate point. The size of the ovum (as distinguished from the embryo) is no reliable guide to the age of the embryo; for oftentimes the placenta and membranes have a size and thickness much beyond what the mere embryonic development would lead us to expect. Mauriceau, in his 150th aphorism, recognises this fact, and lays down the rule that the size of the fœtus, in those dead abortions, does not always correspond to the period of pregnancy.

Whether the secundines can continue to grow in a normal healthy manner after the death of the embryo, seems to be a moot point. The examination of a large number of aborted ova leads me to the conclusion that such progressive development may go on for a limited period; whilst that a morbid growth—such as hydatiginous or cystic disease—may take place, and proceed even to a great extent, is very well known. I confess I do not see any anatomical difficulty in either case, as the placenta and membranes derive their nourishment from the uterus, and not from the fœtus. It is far from uncommon to find no trace or vestige of an embryo in the sac of the amnion, it having been either dissolved in the surrounding fluid, or the ovum never having contained an embryo, being, as Duncan expresses it, "addled from the beginning." Hence, paradoxical though it may appear, it is possible for a woman to be pregnant, and not truly with child.

The *symptoms* which may be expected in any of these cases are very succinctly pointed out by Dr. Matthews Duncan in his paper, already noticed; indeed, upon this point, as well as the treatment, I know of no writer who has given us so much valuable information. The usual course of events is very much as follows:—A woman conceives, and has the ordinary symptoms of pregnancy up to the second, third, or fourth month, as the case may be. She then, with or without a threatening of miscarriage, gradually loses the signs of pregnancy, and may, perhaps, have some reason to think that she really has aborted. Her health becomes impaired, pelvic weight and uneasiness are complained of, and she has frequent recurrences of sanguineous discharge, which are often mistaken for irregular menstruation, or there may be, in addition, periodic menorrhagia. In some cases the discharge is fetid, and in others it is not so.

It is commonly at this stage of her history that our advice is sought; and the chief questions which present themselves for solution are—Is the uterus gravid? If so, is the embryo living, or is it dead? In fact, our inquiries narrow themselves to this one, which is of paramount importance, viz. does the uterus contain a *living* ovum? This point once decided, our ulterior proceedings are, comparatively speaking, plain enough. Duncan observes that "the diagnosis will be easily made if the practitioner only suspects the true nature of the case, and is thus induced to investigate it." But in very many cases a great deal more is needed in order to arrive at a correct solution of the problem before us. Montgomery gives very excellent and judicious advice to aid us in discriminating these cases, and has well described the difficulties that beset us in making a diagnosis. "I know of no class of cases," he writes, "more unsatisfactory or puzzling." Besides the irregular discharges of blood or bloody mucus from the vagina, there is sometimes considerable menorrhagia as well. The os uteri will be generally found in a gaping, patulous state, whilst the body of the organ is more or less enlarged; if, along with these symptoms, the discharges have a fetid character, there need be little hesitation in coming to a conclusion. Putridity of the discharge is a circumstance of great semeiological value in these cases, but unfortunately this symptom may or may not be present. Dr. Duncan has specially investigated the subject before us from this point of view, heading his memoir, 'Presence or Absence of Fetid Discharge in Cases of Imperfect Deliverance.' If the membranes are unbroken,

and the air has not had access to the interior of the uterus, there are grounds for believing that putrefactive decomposition will not take place. This is my own experience, as well as that of Velpeau, and I have found it to hold good at every period of pregnancy, and not in the early months only. As bearing on this circumstance —the putridity of the discharge—I may mention that once this has been decidedly developed, there is seldom any considerable amount of hæmorrhage. This I first learned from the late Dr. Charles Johnson, and I have found it to be pretty generally correct. The catalogue of constitutional symptoms, laid down by Burns and other writers as belonging to these cases, really does not present characteristic features, as these symptoms might often be adequately accounted for by the hæmorrhagic discharges, and the prolonged confinement of the patient to the house or sofa. At the same time I am far from denying that a formidable train of symptoms, resembling those described by Puzos, Burns, and many other writers does sometimes occur where there is retention of a portion or of the entire of the ovum; and I believe we may lay it down as an aphorism, that the more advanced the development of the ovum is, so much the more likely is the retention to be productive of ill consequences to the health of the patient. On a few rare occasions I have seen symptoms present that might, perhaps, have been set down to septicæmia; and two cases have fallen under my notice of phlegmasia dolens, of one and of both legs, induced, apparently, by the presence of a portion of the dead ovum in utero.

The following is a fair typical case of this kind. The wife of a surgeon in the army ceased menstruating the 11th November, 1873, and soon afterwards all the symptoms of pregnancy gradually became developed. The latter end of January she got a fright out driving, and was much shaken in a covered car; to this succeeded a sharp attack of diarrhœa, lasting for three days, and then controlled by opium. From this time all the symptoms of pregnancy subsided. The third menstrual period (beginning of February passed over without any appearance of blood, but soon after this, and about the middle of the month, some red discharge began to flow from the vagina, not in any considerable quantity, however, nor for any length of time. It recurred again and again at uncertain intervals, of two or three or four days, obliging her to keep very much within doors, and to use little or no exertion. The returns of the menstrual epoch were marked by the loss being tolerably

profuse. Her health became somewhat impaired; she lost colour, got dark under the eyes, and was out of spirits. Things went on in this manner for several weeks, when I saw her; and being allowed to examine her, I satisfied myself there was some enlargement of the body of the uterus, but no other symptom of pregnancy. There was no discharge at this time, neither was there ulceration or patulence of the os uteri. On the 11th June, after some hours' continuance of pain, and bloody discharge, an ovum was expelled. From the appearance of this ovum, when recently discharged, I concluded it had a development of about six or eight weeks, so that it was pent up in the uterus, subsequently to its being blighted, for about five months. At no time during the progress of this case had the discharges any fœtid character.

In by far the major proportion of these cases, time and an expectant treatment will suffice to bring matters to a successful issue. The chief source of anxiety is hæmorrhage, and hence the management of the patient must be mainly directed with a view to ward off or restrain the loss of blood. It often happens in these cases that a very little artificial provocation is sufficient to excite expulsive action of the uterus, whereby the offending substance is at length got rid of, and the patient restored to health. I have sometimes known the simple digital and specular examination to have been followed by the discharge of the dead ovum; on other occasions the use of the sound has led to the same result; and again, in more cases the use of the sound and the subsequent administration of ergot of rye have induced an amount of uterine contractions sufficient to expel the remains of the ovum. If these remedies fail, or if the patient is urgent for prompt and decisive treatment, we have, fortunately, an alternative measure to fall back upon, of which our obstetric predecessors had no knowledge. David Davis in his great work upon 'Obstetric Medicine,' published in 1836, when speaking of retention of the placenta or membranes after abortion, adds—"this (retention) is the more unfortunate, inasmuch as art has little in its power to effect for the relief of such cases." The alternative measure to which I have alluded consists in the artificial dilatation of the neck of the womb, and removing from its cavity the ovum, or whatever may remain of it. For the extraction of these substances, Levret, Dewees, Bond, Churchill, and myself, have devised special instruments; but unless the neck of the womb be well open, their employment is unsatisfactory and hazard-

ous; except, indeed, the offending substance happen to be protruding from the os uteri.

This dilatation of the cervix uteri by sponge or laminaria tents is generally a safe proceeding, but if any inflammatory action be present it should on no account be attempted.

Sect. 3.—*Of Coughs, Vomitings, &c.*

Miscarriages may also be produced from every force that will stretch the neck and mouth of the womb; such as violent coughs, vomitings, costive strainings at stool, cathartics that bring on a superpurgation and tenesmus, together with frequent convulsions. All these symptoms must be treated in the usual method: the cough and vomiting may be abated or removed chiefly by venæsection and opiates; the constipation, by glysters and gentle laxative medicines; the superpurgation, by opiates; the tenesmus, by these and oily injections; the convulsions, by blooding and blisters; and as the more violent convulsions happen generally when the woman is near her full time, if they are not soon removed, but continue and increase to the manifest hazard of the patient's life, she ought to be delivered immediately in the same manner as in the case of a flooding in the last months. See Cases 78 *et seq.*, and 342 *et seq.*

Sect. 4.—*Of Longings.*

Abortion may be likewise occasioned by uncommon longings for things that cannot be soon or easily got, or such as the woman is ashamed to ask for, especially in her first child, namely, different kinds of food and drink. These appetites, if not gratified, sometimes produce a miscarriage; and indeed are supposed to affect the child in such a manner, that the body of it shall be impressed with marks resembling the figure or colour of what the mother longed for. These cravings, therefore, though they appear

unreasonable and improper, must be satisfied; and the mother ought to shun every thing that is disagreeable to the senses, because miscarriage may also proceed from surprise at sight of strange and horrible objects. See Cases 89, 90.

[Of the advice contained in the last paragraph, the latter part is most judicious; I cannot say the same of the former however. A pregnant woman assuredly ought not to be allowed to indulge such cravings as are plainly "unreasonable and improper." I have never known harm to arise from interdicting the use of unwholesome articles of food, and have often seen evil consequences induced by them. One lady who was in the habit of consuming enormous quantities of raw starch, had her rectum and colon so impacted with this material when she fell in labour, that a great deal of ingenuity and force were required to clear out the bowel and make room for the passage of the fœtus through the pelvis.

But a pregnant woman's longings and fancies may advantageously be complied with, if they be within the limits of reason and common sense.]

BOOK III.

CHAPTER I.

Sect. 1.—*Of the Child's Situation in the Uterus.*

The embryo or fœtus, as it lies in the uterus, is nearly of a circular or rather oval figure, which is calculated to take up as little space as possible. The chin rests upon the breast; the thighs are pressed along the belly; the heels applied to the breech; the face being placed between the knees; while the arms cross each other round the legs.

[This assigned position of the arms is surely exceptional; their place usually being across the chest or abdomen, or placed with the elbow against the ribs, and the hand applied to the cheek or side of the head, as we generally see an infant to place its hands immediately after birth. In none of Smellie's plates which exhibit the "situation," or attitude of the fœtus in utero, are the arms disposed after the manner described in the text,—a discrepancy not a little remarkable in so careful and accurate an author.]

The head for the most part is down to the lower part of the uterus; and, the child being contracted into an oval form, the greatest length is from head to breech; but the distance from one side to the other is very much less than that from the fore to the back part, because the thighs and legs are doubled along the belly and stomach, and the head bended forwards on the breast. The uterus being confined by the vertebræ of the loins, the distance from the back to the fore part of it must be less than from side to side; so

that in all probability, one side of the fœtus is turned towards the back and the other to the fore part of the womb, but as the back-part of the uterus forms a little longish cavity on each side of the vertebræ, the fore-parts of the fœtus may therefore, for the most part, tilt more backwards than forwards.

[This description is true in every particular. The average diameter of the uterus, from side to side in the latter end of pregnancy, is about an inch (more in primiparæ) greater than its antero-posterior diameter. As the cause or consequence of this, we find that the fœtus very seldom lies with its spine exactly coincident to the median line of the uterus, but to one or other side of it. "Whether the child's head," says William Hunter, "be downwards or upwards, the back parts of the child are commonly turned more or less towards one side of the mother, and its fore parts in proportion towards the other; so that more of the child lies in one side of the mother than in the other; and this is sometimes the right side and sometimes the left." *On Gravid Uterus;* Rigby's edition, p. 58.]

It has been generally supposed that the head is turned up to the fundus, and the breech to the os uteri, with the fore-parts towards the mother's belly; and that it remains in this situation till labour begins, when the head comes downwards, and the face is turned to the back of the mother. Some allege, that the head precipitates about the end of the eighth or beginning of the ninth month, by becoming specifically heavier than the rest of the body. Others affirm, that as the child increases in bulk, especially during the two last months, the proportion of surrounding water must be diminished so as that it is confined in its motion, and in struggling to alter its position the head is moved to the os tincæ, where it remains till delivery. The particulars of this and other theories, may be found in Mauriceau, Le Motte, Simpson, and Ould. But from the following observations it seems more probable, that the head is for the most part turned down to the lower part of the uterus, from conception to delivery.

In the first month, according to some writers, the embryo exhibits the figure of a tadpole, with a large head and small body or tail, which gradually increases in magnitude, till the arms and thighs begin to bud or strut out, like small nipples, from the shoulders and breech; two black specks appear on each side of the head, with a little hole or opening between them, which, in the second month, are easily distinguished to be the eyes and mouth. (See Tab. V, Fig. 3.) The legs and arms are gradually formed, while the body turns larger, but the fingers are not separated or distinct, till the latter end of the second or beginning of third month. (See Tab. VI, fig. 1.) This is commonly the case; but sometimes the bulk and appearance differ considerably in different embryos of the same age. The younger the embryo, the larger and heavier is the head in proportion to the rest of the body; and this is the case in all the different gradations of the fœtus; so that, when dropt or suspended by the navel-string in water, and head must sink lowermost of course. Besides, when women miscarry, in the fourth, fifth, sixth, and seventh months, the head, for the most part, presents itself, and is first delivered. (See Tab. VI, VIII.) By the touch in the vagina, the head is frequently felt in the seventh, sometimes in the sixth, but more frequently in the eighth month; and if the same women are thus examined from time to time till the labour begins, the head will always be felt of a round firm substance at the fore-part of the brim of the pelvis, betwixt the os internum and pubes, through the substance of the vagina and uterus. (See Tab. IX, XI.) But all these opinions are liable to objections. If the descent of the head proceeded from its specific gravity, we should always find it at the os internum, because this reason would always prevail: if it were not owing to a diminished proportion of water, why should we often find the breech presented, even where there is a quantity of that fluid, large enough to give

the head free liberty to rise again towards the fundus, or (according to the other opinion) to sink down, by its specific gravity, to the os internum? Some, indeed, suppose, that the head always presents itself, except when it is hindered by the funis umbilicalis twisting round the neck and body, so as to impede the natural progress. But, were this supposition just, when we turn and deliver by the feet those children that presented in a preternatural way, we should always find them more or less circumvoluted by the navel-string: whereas I have as often found the funis twist-round the neck and body, when the head presented, as in any other case; and when other parts offered, have frequently delivered the child without finding it in the least entangled by that cord. That the head is downwards all the time of gestation, seems, on the whole, to be the most reasonable opinion, though it be liable to the objection already mentioned, and seems contradictory to the observation of some authors, who allege, that, in opening women that died in the fifth, sixth, or seventh month, they have found the child's head towards the fundus uteri. But as it lies as easy in one posture as in another till the birth, this dispute is of less consequence in the practice of Midwifery. It may be useful to suggest, that the wrong posture of the child in the uterus may proceed from circumvolutions of the funis umbilicalis, (see Tab. XXIX.) Or when there is little or no water surrounding the child, it may move into a wrong position, and be confined there by the stricture of the uterus; (see Tab. XXX, XXXI, XXXII, XXXIII.) Or lastly, it may be the effect of a pendulous belly or narrow pelvis, when the head lies forward over the pubis. See Collect. XIII, and Tab. XII, XXVII, XXXIV.

[The position of the fœtus in utero *before* parturition sets in, is one thing; another and quite a different one is its position after parturition has commenced. This is a distinction which should be

observed in order to reason correctly on this subject, but which many writers have quite overlooked.

Again, some earnest and laborious investigators have altogether lost sight of the fact that the simple weight of one part of the fœtus compared to that of another part is of little or no value in the inquiry as to the relative position held by the fœtus in the uterine cavity: it is the *specific gravity* of any part as compared with that of the liquor amnii, which is chiefly to be considered.

The notion of Hippocrates that the fœtus lay with its head to the fundus uteri, until about the seventh or eighth month, when it performed a somersault which brought the head to the os uteri, was the universally received doctrine up to Smellie's time. He was the first who successfully opposed it, and his opinions received the able support of Solayres, of Baudelocque, and of William Hunter, who remarks: "All the observations that I have been able to make in dissections and in the practice of Midwifery, would persuade me that the child's head is naturally downwards through all the later months of utero-gestation, and that neither reason nor instinct teaches it at a particular time, any trick of a tumbler or rope-dancer." [1]

Smellie maintained "that the head for the most part turned down to the lower part of the uterus from conception to delivery." The general truth of this statement cannot, I believe, be now called in question. But Smellie goes farther, and attributes this position of the fœtus to the influence of gravity simply: and here again he is supported by the results of modern investigation, although some of his reasoning in the passages which follow, is unsound. Among the defenders of the gravitation theory, the ablest by far is Matthews Duncan, who has exposed the many fallacies which entered into the reasoning of Dubois, Simpson and other opponents of this theory.

A vast deal of time and ingenuity has been expended on the investigation of this subject by Dubois, Virey, Simpson, Duncan, Veit, Scanzoni, Poppel, Höning, Kehrer, and others: and the result of their researches and experiments amount to this, that whilst

[1] Chinese obstetricians suppose that "the fœtus sits upright in the womb till the time of birth, when it bends down its head, and turns its body towards the contracted opening of the womb patiently, till it turns its body to the gate of life, the head being then below and the feet above, as though it were suspended upside down." ('A treatise on Midwifery,' translated from the Chinese by W. Lockhart, M.D. 'Dub. Med. Jour.,' January, 1842).

gravity seems to be the chief cause operating on the fœtus in determining its position in utero, still that reflex fœtal movements; the shape of the uterus; circumvolutions of the umbilical cord; putridity of the fœtus; hydrocephalus: or monstrosity; may also in some slight degree co-operate to affect the child's position in the uterus when surrounded by the liquor amnii.

Sect. 2.—*Of Touching.*

Touching is performed by introdueing the fore-finger lubricated with pomatum into the vagina, in order to feel the os internum and neek of the uterus; and sometimes into the reetum, to diseover the stretehing of the fundus.

[It may be well to remark that the word *stretching,* which occurs here and in many other places, is used by Smellie, in the sense of *distension* or *enlargement.*]

By some, we are advised to toueh with the middle finger, as being the longest; and by others, to employ both that and the first; but the middle is too mueh encumbered by that on eaeh side, to answer the purpose fully; and when two are introdueed together, the patient never fails to complain. The design of toueliing is to be informed whether the woman is or is not with ehild; to know how far she is advaneed in her pregnaney; if she is in danger of a misearriage; if the os uteri be dilated; and, in time of labour, to form a right judgment of the ease from the opening of the os internum, and the pressing down of the membranes with their waters; and lastly, to distinguish what part of the ehild is presented.

It is generally impraetieable to diseover by a toueh in the vagina, whether or not the uterus is impregnated, till after the fourth month: when the best time for examination is the morning, when the women is fasting, after the eontents of the bladder and reetum have been diseharged; and she ought, if neeessary, to submit to the inquiry a standing posture; because, in that ease, the uterus hangs lower down in the vagina, and the weight is more sensible to the

touch than when she lies reclined. One principal reason of our uncertainty is, when we try to feel the neck, the womb rises up on our pressing against the vagina, at the side of the os internum, (see Tab. VI, fig. 1); and in some, the vagina feels very tense; but, when the fundus uteri is advanced near the navel, the pressure from above keeps down the os internum so much, that you can generally feel both the neck, and, above that, the stretching of the under part of the uterus. See Tab. VI, VIII.

There is no considerable variation to be felt in the figure of the os internum, except in the latter end of pregnancy, when it sometimes grows larger and softer (see Tab. IX); nor do the lips seem to be more closed in a woman with child than in another, especially in the beginning of pregnancy; but, in both cases, the os uteri is felt like the mouth of a young puppy or tench, as we have before observed. In some, the lips are very small; in others, large; and sometimes, though seldom, smoothed over or pointed. In many women, who have formerly had children and difficult labours, the lips are large, and so much separated as to admit the tip of an ordinary finger; but, a little higher up, the neck seems to be quite closed.

In the first four months, the neck of the womb may be felt hanging down in the vagina, by pushing up the finger by the side of the os internum; but the stretching of the uterus and upper part of the neck cannot be perceived till the fifth, and sometimes the sixth month; and even then the uterus must be kept down, by a strong pressure upon the belly.

The stretching of the fundus is sometimes felt by the finger introduced into the rectum, before it can be perceived in the vagina; because, in this last method, the uterus recedes from the touch, and rises too high to be accurately distinguished; whereas the finger, being introduced into the rectum, passes along the back of the womb

almost to the upper part of the fundus, which, in an unimpregnated state is felt flat on the back-part, and jetting out at the sides; but the impregnated uterus is perceived like a large round tumour.

About the fifth or sixth month, the upper part of the uterus is so much stretched, as to rise three or four inches above the os pubis, or to the middle space between that and the navel; so that, by pressing the hand on the belly, especially on lean women, it is frequently perceived (see Tab. VII); and if, at the same time, the index of the other hand be introduced in the vagina, the neck will seem shortened, particularly at the fore-part and sides; and, as I have already observed, the weight will be sensibly felt; but if the parietes of the abdomen are stretched after eating, one may be deceived by the pressure of the stomach, because weight and pressure are the same. But all these signs are more perceptible towards the latter end of pregnancy; and in some women the os internum is felt a little open some weeks before the full time, though generally it is not opened till a few days before labour begins.

From the fifth to the ninth month, the neck of the uterus becomes shorter and shorter, and the stretching of the womb grows more and more perceptible. In the seventh month, the fundus rises as high as the navel; in the eighth month, to the middle space betwixt the navel and scrobiculus cordis, and in the ninth even to the scrobiculus, except in pendulous bellies. (See Tab. VII, VIII, IX.) But all these marks may vary in different women; for when the belly is pendulous, the parts below the navel are much more stretched than those above, and hang over the os pubis; the fundus will then be only equal to, or a little higher than, the navel; at other times, the uterus will rise in the latter end of the seventh or eighth month to the scrobiculus cordis. The neck of the womb will, in some, be felt as long in the eighth, as in others in the sixth or seventh

month. This variation sometimes makes the examination of the abdomen more certain than the touch of the vagina; and so *vice versa*. At other times, we must judge by both. See Collect. XIII and Tab. XII.

[Whilst recognising many of the characters which belong to the cervix as the result of impregnation, still it does not appear that Smellie had given special attention to this point or attached much importance to it. He distinctly lays it down that from the fifth to the ninth month, the neck of the uterus becomes shorter and shorter," but he elsewhere states there is variation in this respect, and that "the neck of the womb will, in some be felt as long in the eighth, as in others in the sixth or seventh month;" and that "in many women who have formerly had children and difficult labours, the lips are large and so much separated as to admit the tip of an ordinary finger." With the exception of the first, all these statements receive the fullest confirmation from practical men. In justice to Smellie, however, it must be noted that while holding as a general rule the shortening of the neck, he does not state here or elsewhere, so far as I can see, that the neck contributes to the general enlargement of the womb, as was taught by Desormeaux and most succeeding writers. This doctrine has been strongly controverted by Weitbrecht, Stoltz, Duncan, and Cazeaux. These writers maintain that the actual length of the cervix continues undiminished—with partial exception in the case of primiparæ—until shortly before the accession of labour; and that in multiparæ it is very often found open and expanded so to to admit the end of the finger for several weeks before labour in accordance with the observation of Smellie, Montgomery, Farre, and others. They admit that to the touch the cervix does very often appear to be shortened, but that this is a deceptive sensation arising from the softening of the uterine tissue induced by pregnancy. That men of such practical experience and tactile proficiency as Smellie, Desormeaux, Gooch, Montgomery, and others, could be mistaken on such a simple matter as the amount of projection of the cervix into the vagina, is quite incredible; and yet, on the other hand, numerous dissections have demonstrated that the length of the interval between the os internum and os externum uteri, is little, if at all diminished, in the majority of cases until the last few days or weeks of pregnancy. How then is this discrepancy to be explained? Dr. Arthur Farre's observations have

come to our assistance and tend to reconcile the difference of opinion existing on the point before us. After giving an illustration which exhibits the condition of the cervix uteri of a multipara who died in the eighth month of pregnancy of phthisis, he proceeds to remark, "Here it will be perceived, that, without any actual diminution of the length of the cervix, which measured rather more than an inch, still there is no projection of it into the vagnia; but that it forms a flat roof to that canal in the mode which is usually described and explained, as indicating the entire absorption of the uterine neck. The true explanation of this, as it appears to me, is, that the apparent shortening of the neck is caused not, at first, by any diminution of its actual length, but by an increase of its breadth, or its extension in the lateral direction, whereby the projection of the lips into the vagina is reduced to the smallest possible amount. The rest of the process upon which the shortening of the cervix depends, may be explained, by the variable condition of the internal os uteri, or upper orifice of the cervix. If this remains unyielding until the time of labour, then the finger on being placed within the cervix, traverses the whole length of the canal before it reaches any part of the child; and the general form and substance of the cervix being retained, the neck is said to be unobliterated. Such is usually the state of parts after repeated pregnancies. But if the internal or upper os yields readily, as it usually does in the more advanced stage of a first pregnancy, then the head of the child gradually settles down upon the lower orifice, pressing aside the soft and yielding wall of the cervix, which thus forms for it a shallow, cup-like, or funnel-shaped recess, that may be so far said to be added to the uterine cavity; and the finger, on passing within the os readily touches the child, without having to traverse any length of cervix" (*Cyclop. of Anat. and Physiol., Art.* Uterus). It is clear, then, from all these observations, that no fixed or absolute rule can be laid down for all cases, but that within certain limits a good deal of variation is to be met with in regard to the condition of the cervix during the latter half of pregnancy.]

Sect. 3.—*Of the Signs of Conception, and the equivocal Signs of pregnant and obstructed Women.*

The signs of pregnancy are to be distinguished from those that belong to obstructions, by the touch in the

vagina, and motion of the child, in the fifth or sixth month; sometimes, by the touch in the rectum, before and after the fifth month, when the tumour of the abdomen is plainly perceived.

Most women, a day or two before the eruption of the catamenia, labour under complaints preceding from a plethora; such as stretching pains in the back and loins, inside of the thighs, breast, and head; a sickness and oppression at the stomach, and a fulness of all the viscera of the abdomen; and all these symptoms abate, and gradually vanish, when the discharge begins and continues to flow. But if the woman be obstructed by any accident or error in the non-naturals, all those complaints continue and increase, and are hardly distinguishable from the symtoms of pregnancy, till the end of the fourth month; at which period, women with child grow better, and all the complaints of fulness gradually wear off; whereas those who are only obstructed, grow worse and worse, from the increase of the lentor in the fluids, which will in time produce various and dangerous diseases. The fundus uteri, in the obstructed patient, is not stretched, nor is the disorder in her stomach so violent as in a pregnant woman, and seldom accompanied with retchings; while the woman with child is afflicted with a retching every morning, and subject to longings besides. The first labours under a fulness of the vessels; the last, over and above this complaint, suffers an additional one from the distension of the uterus by the impregnated ovum. Obstructions and pregnancy are both accompanied by a stretching fulness of the breasts; but in the last only may be perceived the arcola, or brown ring, round the nipples, from which in the last months, a thin serum distils: but this circle is not always so discernible as in the first pregnancy, and even then is uncertain as well as the others.

About the fifth or sixth month, the circumscribed

tumour, or stretching of the uterus, is felt above the os pubis; and by this circumscription and consistence, easily distinguished from the ascites or dropsy of the abdomen; it is also rounder and firmer than those swellings that accompany obstructions which proceed from a general fulness of the vessels belonging to the ligaments and neighbouring viscera.

On the whole, the difficulty of distinguishing between obstruction and pregnancy, in the first months, is so great, that we ought to be cautious in giving our opinion; and never prescribe such remedies as may endanger the fruit of the womb, but rather endeavour to palliate the complaints until time shall discover the nature of the case; and always judge on the charitable side, when life or reputation is at stake.

In the fifth or sixth month of uterine gestation, by the touch in the vagina, we perceive the neck of the womb considerably shortened; and the stretching of the lower part of the uterus is then sensibly felt between the mouth of the womb and the pubes, and on each side of the neck. See Tab. VI, VIII.

In the seventh month, the head of the child is frequently felt resting against the lower part of the uterus, between the pubes and the os internum; and, being pushed upward towards the fundus, sinks down again by its own gravity.

All these diagnostics are more plain and certain the nearer the patient approaches to the time of delivery.

[In these few words we recognise that unequivocal test of pregnancy which has been called *ballottement*, or repercussion, and which has this signal advantage over auscultation of the fœtal heart, that it is not affected by the life or death of the child. Ordinarily ballottement is practised with the patient lying on her back with the chest well raised, and the thighs flexed on the pelvis; but the best position by far is with the patient standing erect. The sensation experienced by the upward displacement of the fœtus (the

finger pressing on the cervix, or on the uterus immediately in front of the cervix) and its descent again on the tip of the finger is quite peculiar, easily recognisable, and not to be simulated by any known disease or other condition of the uterus. A large calculus in a very distended bladder might yield a similar sensation, I admit; but to mistake this state of things for pregnancy seems scarcely within the remotest limits of possibility. Neither can I see how anteversion of the uterus could give rise to a sensation resembling ballottement, if the examiner had ever—even once—felt true ballottement, and conducted the examination with due care and deliberation. Percussion can sometimes be practised on the surface of the abdomen with the two hands—one on each side. A better way is to place the patient in the genu-cubital position, resting her folded arms on a stool or cushion. The examiner then applies his fingers over the most prominent part of the uterus, and endeavours by a sudden upward movement to displace the fœtus, and to feel its descent again on the hand. Ballottement is rarely practicable in early, or very advanced pregnancy (here Smellie is in the wrong); nor in twin cases; nor where the liquor amnii is deficient in quantity; the mechanical conditions necessary for its production being generally absent in such cases. The diagnostic value of this test was singularly exemplified in a case recorded by Dr. Gaillard Thomas, of New York, who by its means diagnosed, *per vaginam*, a left tubal pregnancy about the fourth month; and, acting upon this diagnosis, he successfully opened the cyst from the vagina, and removed the embryo and secundines. ('New York Med. Journ.,' June, 1875.) So delicate an application of this physical sign is perhaps unequalled up to the present time.

Modern discovery has supplied us with "a sign of conception" which, if present, at once establishes the fact of pregnancy, and dispenses with the necessity of any further investigation. I allude to the sounds of the fœtal heart. Besides its value as conclusively pointing out the condition of the patient, this sign also aids us in diagnosing the position of the fœtus in the uterus; in recognising the presence of turns; and in surmising what the sex of the child is. As not much has been written on this last subject I give an extract from a paper on 'Fœtal Physical Diagnosis,' by Dr. Frank C. Wilson, of Louisville, U.S. "From an analysis of 126 cases," writes Dr. Wilson, "I tabulated the following rules for determining the sex:—

From 110 to 125 almost certainly male.
„ 125 to 130 probably male.
„ 130 to 134 doubtful with chances in favor of male.
„ 134 to 138 „ „ female.
„ 138 to 143 probably female.
„ 143 to 170 almost certainly female.

Out of 106 cases whose record has been kept, of those whose hearts beat from 110 to 125, there were thirty-five males and two females.

From 125 to 130	.	13 males and 2 females.
„ 130 to 134	.	8 „ 4 „
„ 134 to 138	.	5 females and 2 males.
„ 138 to 143	.	7 „ 2 „
„ 143 to 170	.	24 „ 2 „

It may be well to explain here that the above numbers have reference to the frequency of the cardiac pulsations of the fœtus.

Thus we see that, although the sex may not be determined with absolute certainty, yet we can certainly make a very shrewd guess. Although I have not made any series of observations with a view to test the point before us, yet I am satisfied that, as a general rule, the pulse of the female fœtus is more frequent than that of the male fœtus, and acting on this I have often ventured to make a prediction of the sex of the child, which has subsequently proved to be correct.]

Sometimes, the head is not felt till the eighth or ninth month; and in some few cases not till after the membranes are broke, when it is forced down by the contraction of the uterus and strong labour-pains. This circumstance may be owing to the head's resting above the basin, especially in a narrow pelvis; or to the distension of its belly with air after death, by which the fœtus being rendered specifically lighter than the surrounding waters, the body floats up to the fundus, if there is a large quantity of fluid in the membranes; nor is the body always felt when the child lies across the uterus. See Collect. XIII.

[This floating of the fœtus up to the fundus of the uterus, in consequence of its distension by air, the result of putrefaction, is to my mind a very unsatisfactory explanation. I have in a former note

(p. 127) stated that such emphysema, so far as my experience enables me to judge, never occurs in the fœtus before the escape of the waters; and even supposing it did take place, the quantity of amniotic fluid should be very excessive to admit of such a considerable and ready change of position of the fœtus.]

Sect. 4.—*How to distinguish the False Labour from the True, and the Means to be used on that occasion.*

If the os uteri remains close shut, it may be taken for granted that the woman is not yet in labour, notwithstanding the pains she may suffer. With regard to these, an accurate inquiry is to be made; and if her complaints proceed from an overstretching fulness of the uterus, or vessels belonging to the neighbouring parts, blooding in the arm or ankle, to the quantity of six or eight ounces, ought to be prescribed, and repeated occasionally. If the pains are occasioned by a looseness or diarrhœa, it must be immediately restrained with opiates.

Colic pains are distinguished from those of labour by being chiefly confined to the belly, without going off and returning by distinct intervals; they are for the most part produced by fæces too long retained in the colon, or by such ingesta as occasion a rarefaction or expansion of air in the intestines, by which they are violently stretched and vellicated. This complaint must be removed by opening glysters, to empty the guts of their noxious contents; and this evacuation being performed, opiates may be administered to assuage the pains; either to be injected by the anus, taken by the mouth, or applied externally in the form of epithem or embrocation.

Sometimes the os internum may be a little dilated, and yet it may be difficult to judge whether or not the patient be in labour. The case, however may be ascertained after some attendance, by these considerations. If the woman

is not arrived at her full time; if no soft or glairy mucus hath been discharged from the vagina; if the pains are limited to the region of the belly, without extending to the back and inside of the thighs: if they are slight, and continue without intermission or increase; nay, if they have long intervals, and recur without force sufficient to push down the waters and membranes, or child's head, to open the os internum; if this part be felt thick and rigid, instead of being soft, thin, and yielding: we may safely pronounce, that labour is not yet begun; and those alarms are to be removed as we have directed in the case of false or colic pains. Besides, if the pulse be quick and strong, and the patient attacked by stitches in the sides, back, or head, blooding will be likewise necessary. See Collect. XIII and Tab. VIII, IX, X.

[To this description, brief though it be, of false labour, there is really little room for addition. Pains which have their seat external to the uterus, as those of colic, diarrhœa, dysentery, &c., will often admit of being at once distinguished from labour pain by a very simple test, viz. by the fact of the uterus continuing soft and yielding during the presence of the pain. This negative sign when present is conclusive. But a painless rhythmical contraction of the uterus may chance to be in progress at the moment of our examining the abdomen, and would tend to mislead. Dr. Braxton Hicks has drawn attention to these recurrent spontaneous contractions, and says they are present at short intervals all through pregnancy, and occur quite independently of external irritation ('Trans. of Lond. Obstet. Soc.,' vol. xiii).

But, on the other hand, we may have contractions, and even painful contractions, of the uterus without any true labour, and these are just the most difficult class of cases wherein to make a diagnosis, and if our treatment be actively in accordance with our diagnosis, it will often ensure its confirmation, as many of these cases if let alone would soon run into actual labour. Again, it sometimes happens towards the latter end of gestation that pains which set in with all the appearance of true pains, may after some hours' continuance become irregular, cease to produce any effect in opening

the os, and gradually subside, not to be renewed for some days or weeks perhaps. When we find them taking this course, the best thing to be done after clearing out the bowels, is to give a full opiate as recommended by our author. Indeed, opium is our sheet anchor in all cases where we want to allay spurious pains, or avert premature labour; and the sooner it is administered the more certain will be its effect. One caution, however, is necessary: if we have reason to suppose the patient to be at, or near, the end of her term, or the fœtus to be dead, then we should be extremely guarded how we employ opiates to arrest the uterine contractions, lest through our interference labour be altogether pretermitted, or "missed," as Dr. Oldham called it. I have sometimes seen a very unexpected result to supervene upon the administration of an opiate given with a view to arrest what seemed to be spurious or irregular pains; and this result was the speedy accession of true pains of an active and decided kind. Dr. Churchill tells me that he has often known such to occur. We may explain its action here, on the supposition that delay was occasioned by some degree of spasm which the opium subdued.]

Sect. 5.—*The Division of Labours.*

Hippocrates, and almost all the writers upon this subject from his time to the fifteenth century, divided labour into two kinds; namely, Natural and Preternatural. The first comprehended those cases in which the head (others say the head and breech) presented, though the presentation of the head was always deemed the most natural: the other included all births in which any other part of the body first offered itself. And though they did not, like us, use a third distinction, they seem to have understood it in their practice; for, among their chirurgical operations, we always find a chapter on the method of delivering dead children, by opening the head, and extracting with the crotchet.

At present, labours are divided into natural, according to the ancients, when the head or breech presents; laborious, when, notwithstanding this situation of the child, the delivery goes on so tediously, that the woman is in danger

of losing her life, unless she is assisted with the operator's hand, fillet, forceps, blunt hook, or crotchet; and preternatural, when neither head nor breech presents, so that for the most part there is a necessity for turning the child and bringing it away by the feet. But the division of labours hath been varied according to the opinion of different people. Some think that all those cases ought to be deemed preternatural, in which any part of the body (the head itself not excepted) presents in an unusual way. Others affirm, that whatever part presents, or however the posture of the child may be, if it is delivered without any other assistance than that of the labour-pains, the birth ought to be called natural; laborious, when in these cases the child is born with difficulty; and preternatural, when, lying across the uterus, it must be turned and delivered by the feet.

For my own part, having in teaching found all these divisions liable to objections, I have followed a method which is more simple than the other, and will save abundance of repetition.

I call that a natural labour, in which the head presents, and the woman is delivered by her pains and the assistance commonly given; but, should the case be so tedious and lingering, that we are obliged to use extraordinary force in stretching the parts, extracting with the forceps, or (to save the mother's life) in opening the head and delivering with the crotchet, I distinguish it by the appellation of laborious: and in the preternatural, I comprehend all those cases in which the child is brought by the feet, or the body delivered before the head. Neither do I mind how the child presents, so much as the way in which it is delivered: for there are cases in which the head presents, and for several hours we expect the child will be delivered in the natural way; but, if the woman has not strength enough to force down the child's head into the pelvis, or in flood-

ings, we are at length obliged to turn and bring it by the feet, because it is so high that the forceps cannot be applied, and, if the child is not large nor the pelvis narrow, it were pity to destroy the hopes of the parents, by opening the skull and extracting with the crotchet. In this case, therefore, although the child presents in a natural way, we are obliged to turn and deliver it in the same manner as if the shoulder, breast, or back, had presented; and, generally, this operation is more difficult than in either of those cases, because, if the waters are all discharged, and the uterus close contracted round the fœtus, it is more difficult to raise the head to the fundus. When the breech presents, we are frequently obliged to push it up and search for the legs; which being found, we proceed to deliver the body, and lastly the head. If the head is large or the pelvis narrow, and the waters not discharged, we ought, if possible, to turn the child into the natural position.

For a farther illustration, and to inform young practitioners that difficult cases do not frequently occur: suppose, of three thousand women in one town or village, one thousand shall be delivered in the space of one year, and in nine hundred and ninety of these births the child shall be born without any other than common assistance. Fifty children of this number shall offer with the forehead turned to one side at the lower part of the pelvis, where it will stop for some time; ten shall come with the fore-head towards the groin, or middle of the pubes; five shall present with the breech, two or three with the face, and one or two with the ear: yet, all these shall be safely delivered, and the case be more or less lingering and laborious according to the size of the pelvis and child, or strength of the woman. Of the remaining ten that make up the thousand, six shall present with the head differently turned, and two with the breech; and these cannot be saved without stretching the parts, using the forceps or crotchet, or pushing up

the child in order to bring it by the feet; this necessity proceeding either from the weakness of the woman, the rigidity of the parts, a narrow pelvis, or a large child, &c.: the other two shall lie across, and neither head nor breech, but some other part of the body, present, so that the child must be turned and delivered by the feet. Next year, let us suppose another thousand women delivered in the same place; not above three, six, or eight, shall want extraordinary assistance; nay, sometimes, though seldom, when the child is young or unusually small, and the mother has strong pains and a large pelvis, it shall be delivered even in the very worst position, without any other help than that of the labour-pains.

As the head therefore presents right in nine hundred and twenty of a thousand labours, all such are to be accounted natural; those of the other seventy that require assistance may be deemed laborious; and the other ten, to be denominated laborious or preternatural, as they are delivered by the head or feet.

In order, therefore, to render this treatise as distinct as possible, for the sake of the reader's memory, as well as of the dependence and connection of the different labours, they are divided in the following manner. That is accounted *natural* in which the head presents, and the woman is delivered without extraordinary help; those births are called *laborious* or non-natural, when the head comes along with difficulty, and must be assisted either with the hand in opening the parts, or with a fillet or forceps, or even when there is a necessity for opening and extracting it with the crotchet; and those in which the child is brought by the breech or feet, are denominated *preternatural*, because the delivery is performed in a preternatural way.

[The classification of labours laid down by our author is admirable so far as it goes. But the accidents or complications arising out of parturition—such, for example, as hæmorrhage, convulsions,

rupture of the uterus, &c.—have no place in it; although these accidents are commonly of such gravity and importance as to give the most striking character to the case, and most materially to influence its treatment. Indeed, Smellie admits that the fundamental principle in his arrangement of labours is simply "the way in which the child is delivered." To remedy this very obvious defect (though he does not say so, nor at all allude to Smellie in regard to the subject of classification) Denman added a class to Smellie's three, which fourth class comprehends all the graver accidents or complications of parturition, with the exception of rupture of the uterus or vagina, and this, strange to say, he brings in under the heading of difficult labour, though it is the most serious accident that can befall a parturient woman. Smellie, in his definition of natural labour, makes no condition as to its length, whereas Denman lays it down that, in order to constitute a natural labour, the process shall be completed in twenty-four hours, and without artificial assistance; but, as being a rule of time, this distinction is objectionable. Notwithstanding the two defects I have pointed out in the classification of Denman, I consider it, to all intents and purposes, to be the simplest, most practical, and most comprehensive that has ever been propounded.]

CHAPTER II.

NATURAL LABOURS.

SECT. I.—*Of the different Positions of Women in Labour.*

IN almost all countries, the woman is allowed either to sit, walk about, or rest upon a bed, until the os uteri is pretty much dilated by the gravitation of the waters, or (when they are in small quantity) by the head of the fœtus, so that delivery is soon expected; when she is put in such position as is judged more safe, easy, and convenient for that purpose; but the patient may be put upon labour too prematurely, and bad consequences will attend such mistakes. See Collect. XIII, XIV.

Among the Egyptians, Grecians, and Romans, the woman was placed upon a high stool; in Germany and Holland,

they use the chair which is described by Deventer and Heister; and for hot climates the stool is perfectly well adapted; but in northern countries, and cold weather, such a position must endanger the patient's health.

In the West Indies, and some parts of Britain, the woman is seated on a stool made in form of a semicircle: in other places she is placed on a woman's lap; and some, kneeling on a large cushion, are delivered backwards.

In France, the position is chiefly that of half-sitting, half-lying, on the side or end of a bed; or the woman, being in naked bed, is raised up with pillows or a bed-chair.

The London method is very convenient in natural and easy labours: the patient lies in bed upon one side, the knees being contracted to the belly, and a pillow put between them to keep them asunder. But the most commodious method is to prepare a bed and a couch in the same room: a piece of oiled cloth or dressed sheep-skin is laid across the middle of each, over the under-sheet; and above this are spread several folds of linen pinned or tied with tape to each side of the bed and couch. These are designed to sponge up the moisture in time of labour and after delivery; while the oiled cloths or sheep-skins below preserve the feather-bed from being wetted or spoiled: for this purpose, some people lay besides upon the bed several under-sheets over one another, so that by sliding out the uppermost every day, they can keep the bed dry and comfortable.

The couch must be no more than three feet wide, and provided with casters; and the woman, without any other dress than that of a short or half shift, a linen skirt or petticoat open before, and a bed-gown, ought to lie down upon it, and be covered with clothes according to the season of the year. She is commonly laid on the left side, but in this particular she is to consult her own ease; and a large sheet being doubled four times or more, one end must be slipt in below her breech, while the other hangs over the

side of the couch, to be spread on the knee of the accoucheur or midwife, who sits behind her on a low seat. As soon as she is delivered, this sheet must be removed, a soft warm cloth applied to the os externum, and the pillow taken from betwixt her knees: she then must be shifted with a clean warm half-shift, linen skirt, and bed-gown, and the belly kept firm with the broad head-band of the skirt, the ends of which are to be pinned across each other. These measures being taken, the couch must be run close to the bedside, and the patient gently moved from one to another; but if there is no couch, the bed must be furnished with the same apparatus. Some, again, are laid across the foot of the bed, to the head of which the clothes are previously turned up till after delivery, when the woman's posture is adapted, and then they are rolled down again to cover and keep her warm. By this expedient the place of a couch is supplied, and the upper part of the bed preserved soft and clean; whereas those who are laid above the clothes, must be taken up and shifted while the bed is put to rights, in which case they are subject to fainting; and to such as are very much enfeebled, this fatigue is often fatal.

Women are most easily touched, least fatigued, and kept warmest, when they lie on one side. But if the labour should prove tedious, the Parisian method seems most eligible; because, when the patient half sits, half lies, the brim of the pelvis is horizontal; a perpendicular line falling from the middle space between the scrobiculus cordis and navel, would pass exactly through the middle of the basin, as observed in Book I, chap. i, p. 82. In this position, therefore, the weight of the waters, and, after the membranes are broke, that of the child's head, will gravitate downwards, and assist in opening the parts, while the contracting force of the abdominal muscles and uterus is more free, strong, and equal, in this than in any other attitude. Wherefore, in all natural cases, when the labour is lingering

or tedious, this or any other position, such as standing or kneeling, ought to be tried, which, by an additional force, may help to push along the head and alter its direction when it does not advance in the right way. Nevertheless, the patient must by no means be too much fatigued.

When the woman lies on the left side, the right hand must be used in touching, and *vice versa*, unless she is laid across on the bed; in which case, either hand will equally answer the same purpose; but if she lies athwart with the breech towards the bed's foot, it will be most convenient to touch with the left hand when she is upon the left side, and with the right when in the opposite position. And here it will not be amiss to observe, that in the description of all the laborious and preternatural deliveries treated of in this performance, the reader must suppose the woman lying on her back, as directed in chap. iii, sect. 3, and chap. iv. sect. 4, except when another posture is prescribed; and that in natural and laborious labours, whether she be upon her side or back, the head and shoulders are a little raised into a reclining posture, so that she may breathe easily, and assist the pains.

But in preternatural labours, when there is a necessity for using great force in turning the child, the head and shoulders must lie lower than the breech, which, being close to the side or foot of the bed, ought to be raised higher than either; because, when the pelvis is in this situation, the hand and arm are easily pushed up in a right line along the back part of the uterus, even to its fundus. Sometimes, however, when the feet of the child are towards the belly of the mother, they are more easily felt and managed when she lies on her side. At other times, placing the woman on her knees and elbows on a low couch, according to Deventer's method, will succeed better by diminishing in part the strong resistance from the pressure and weight of the uterus and child, by which the feet will sometimes be

easier found and delivered; but then it is safer to the child, and easier for the operator and mother, to turn her to her back before you deliver the body and head.

[At least four different positions have at various times been recommended for the observance of lying-in women. To take a glance at them may not be uninteresting.

I. The most ancient of these is the *sitting posture*, either on the knees of an attendant, or on a perforated stool or chair, as described and figured in the works of Rhodion, Rueff, Raynalde, Paré, Heister, Deventer, &c. &c. Among the ancient Egyptians, Hebrews, Greeks, and Romans the chair or stool was universally employed; and we can readily understand how this posture would naturally be the one assumed in an act that involuntarily calls forth violent expulsive efforts similar to what are required in defæcation. At one time "labour chairs" were in very general use on the continent of Europe, especially in Flanders, Holland, Spain, and Germany, but they fell into disuse until partially revived by Deventer in the beginning of the eighteenth century. Their use is now nearly entirely discontinued except in some districts of Germany, although attempts were made, as Velpeau tells us, to bring them again into vogue, by Rouget and Touchard in France; Ehlère in Germany, and Bigesehi in Italy. In some few places it has been the custom to deliver women in a standing posture, which has this important point in common with the sitting posture, that in both the trunk of the body is more or less upright.

The labour-chair was never generally employed in Great Britain, and not at all for the last century; and I have never heard of its having been used in Ireland. A sitting posture, the perineum and vulva being free from pressure, may sometimes be advantageously resorted to in lingering labours. This can always be conveniently managed by making the woman sit on two chairs placed together angularly, the front corners only being in contact, so that the weight of the trunk rests on the thighs and not at all on the sacrum. When so placed the woman must lean on an attendant, or the footpost of bed, or the back of a chair, when the pain is present. I have on many occasions seen this position have a very good effect in augmenting the pains, and advancing the child. Of course she should be lifted into bed as soon as the head has begun to distend the perineum.

II. The *prone posture*, the parturient woman resting on her

knees and elbows, has been employed at no very distant period in parts of Cornwall, the north of Scotland, and in remote districts of Ireland. Denman was of opinion that resting on the hands and knees is the position instinctively sought for, and perhaps most natural in the time of labour; but here I must differ from him. It has been recommended by Smellie and Deventer in version cases, with a view to lessen the difficulty of finding the feet, and of turning the child; but whether it really could contribute to this result seems more than questionable. The operator might be able to exert his strength to more advantage, perhaps, and where great force was required (as we know it was in many of Smellie's cases of turning), this would be a consideration of some importance; but otherwise I cannot imagine this position to possess any advantage for patient or practitioner. In preternatural and instrumental deliveries Ould directs the patient to be placed on her knees. Very early in my professional life I knew an old accoucheur who always put the patient in this position when using the forceps. He was a good practitioner, and had acquired his experience in a remote part of the north of Ireland, where it was customary among the peasantry to deliver every woman in this posture. Maurieeau and Baudiloeque tell us that in some of the provinces of France women were delivered kneeling or standing. In the course of labour I have often found it serviceable to put the patient into the genu-cubital position for a little time. The change of posture was a relief to her; and where the axis of the uterus seemed to lie too near the spine (as in some primiparæ), its rectification was favoured by the position in question. Schroeder seems to think it is the best position for preventing laceration of the perineum ('Manual of Midwifery,' p. 93). Dr. Gaillard Thomas recommended a position of this kind for the treatment of prolapse of the umbilical cord, and it has been found very successful.

III. The *dorsal position* was formerly very common in Great Britain for delivery, but for the last century it has been completely superseded by the position on left side. For about the same period the supine posture has been nearly universal throughout France, the patient being placed with her shoulders raised, on a *lit de sangles* (or stretcher), which has not been inaptly called the *lit de misere, lit de douleur, lit de travail,* &c. Mesnard, in his 'Guide des Accoucheurs,' gives a plate of a kind of bed, *a lit de camp*, which he recommends for the purpose of delivery. (Op. cit., p. 186.) In most parts of the continent of Europe this is, at the

present day, the ordinary position for delivery. Where instruments are used or the child delivered by the lower extremities, the hips must be placed well over the edge of the bed, and each thigh held by an assistant. When so placed the patient can see every movement of the accoucheur, and her person is much exposed, which are serious objections. However, "it affords," as Dr. D. D. Davis remarks, "ample room for wielding the tremendous forceps commonly used abroad." Smellie appears to have been rather partial to this position in all operation cases, and especially when using the forceps. Chapman, too, recommended it as "the best when any part of the child is to be returned." Though objectionable for delivery, still I have often found benefit from making the patient bear some pains on the back when there is anterior obliquity of the uterus, or when the anterior lip of the os uteri is caught between the head and pubes. There is no doubt but that in the dorsal position an obstreperous patient can be more effectually controlled so as to admit of the safe use of instruments, than in any other posture; the use of chloroform even will not always render a patient docile during the act of instrumental delivery, and hence I have occasionally resorted to this posture under such circumstances. In using the long forceps both Dr. Barnes and Dr. More Madden recommend the patient to be placed on the back in the lithotomy position.[1]

IV. When the lateral position, or that on the side, was first proposed or came to be generally adopted, we cannot precisely say. The earliest writer I find making mention of it is Chapman (1733), who in speaking of the operation of turning, (which he generally performed as the patient lay on her back), adds: "Sometimes I have, in a well-made woman, performed the operation as she lay on her side." Sir Fielding Ould published his 'Midwifery' a few years later, namely in 1742, and in it he makes the following remarks on the subject now under our consideration: "Both in England and Ireland various are the postures that women are delivered in, namely, on their back, side, knees, standing, and sitting on a perforated stool; the side is certainly the most advantageous posture for natural labours; for the patient is less subject to cold, the os coccygis is not thereby pressed inward so as to

[1] According to Chinese obstetric usage, "When the strong bearing pains come on, the woman is supported in a half reclining posture, and a tub or deep wooden platter is so placed as to receive the child on its expulsion." (Lockhart in 'Dub. Med. Jour.,' January, 1842.)

hinder the exit of the child; and as the operator and standers by are by this means behind her back, she is less subject to be disturbed by their remarks and whispers." (p. 33.)

Smellie calls it "the London method," and hence we may fairly conclude it was first brought into use by the London accoucheurs. That the position on left side very soon became generally adopted seems more than probable, from the fact that Pugh in his 'Treatise on Midwifery' (1754) tells us it was "the common posture he made use of, and very seldom any other either in instrumental or turning cases," (page 8); also in Robert Wallace Johnson's 'System of Midwifery,' published in 1769, the position on the side for the lying-in woman is clearly described, nor does he seem to have delivered in any other posture. The first edition of 'Denman's Midwifery' appeared about the year 1785 or 1786, and no other position for delivering is therein laid down. However, so late as 1791, Mr. Charles White, of Manchester, speaks rather approvingly of placing the patient on her hands and knees in natural labours and in some preternatural cases; but his general practice would seem to have been to deliver on the side. Karl Schroeder, one of the latest German writers on obstetrics, when speaking upon our present subject, admits that the lateral position at the time of delivery is more convenient, and more useful in preventing laceration of the perineum than is the dorsal position. ('Manual of Midwifery,' translation by Dr. Carter, p. 92.)

Whilst believing that the advantages in favour of delivering on the side greatly preponderate over those of any other position, still, as has already been stated, we may occasionally derive some benefit from putting the patient into other positions (such as standing, sitting, supine, lateral or genu-cubital), in the course of the labour process. Smellie makes a similar observation (p. 202); and hence we may fairly consider that he was quite aware of the advantages to be derived from "postural treatment" in midwifery practice.]

Sect. 2.—*Of the Management of Women in a Natural Labour.*

In a woman come to full time, labour commonly begins and proceeds in the following manner:—

The os uteri is felt soft and a little opened, the circumference being sometimes thick, but chiefly thin; from this

aperture is discharged a thick mucus, which lubricates the parts, and prepares them for stretching. This discharge usually begins some days before; and is accounted the forerunner of real labour: at the same time the woman is seized at intervals with slight pains that gradually stretch the os uteri, fitting it for a larger dilatation; and when labour actually begins, the pains become more frequent, strong, and lasting.

At every pain the uterus is strongly compressed by the same effort which expels the contents of the rectum at stool; namely, the inflation of the lung, and the contraction of the abdominal muscles.

[This observation can only apply to the expulsive or bearing down pains, which properly belong to the second stage of labour. It seems somewhat surprising that Smellie should not have subdivided the whole course of parturition into stages, espeeially as the foundation for sueh division is so obviously indicated by nature. Denman very clearly apprehended this, and his definition of the stages of labour has never been surpassed for physiological accuracy and praetieal usefulness. Neither does our Author say much about "supporting the perineum"—a proeedure that is now very generally considered to be one of the duties devolving on the accoucheur. He speaks of putting one or two fingers into the reetum, and so pressing upon the forehead of the fœtus; but this is not with a view to guard the perineum, but to prevent recession of the head in the intervals between the pains; and in Book iv, Chap. i, when deserib-ing laeerations of the perineum and the mode of closing them by suture, he alludes to the eauses of laceration, and cases 435, 436, 437, 438, 439 are examples of this accident.

Wallaee Johnson was perhaps the first British author to insist upon supporting the perineum as a duty of the aceoucheur in every ease, whieh he advised to be done with both hands, with or without the interposition of a cloth between the hands and the perineum. ('System of Midwifery,' 1769.) A few years later Alexander Hamilton wrote to the same effect, though not recommending the same mode of giving support to the perineum. ('Elements of the Practice of Midwifery,' 1775.) Neither of these writers allude to the possibility of the perineum being torn by the

passage of the shoulders, immediately after the head has cleared the outlet, and Hamilton's directions about pressing backwards the distended perineum are generally, and very properly, disregarded at the present day.

The rules which I have observed in the discharge of this duty are few and simple: viz. (1.) If the head be advancing too rapidly and before time has been given for the full dilatation of the external orifice, I forbid the patient using any voluntary expulsive efforts, and I administer chloroform to moderate the pains. (2.) Should the perineum be rigid or inflamed, let it be diligently fomented with a sponge wrung out of very hot water. (3.) Abstain from making pressure on the perineum until the head is just about emerging from the orifice. (4.) Let the escape of the head through the vulva be very slow and gradual, its advance being regulated not by pressing on the perineum, but by two fingers of the left hand placed upon the protruding vertex, and directing it forwards as much as possible. (5.) These precautions for preserving the integrity of the part should not be relaxed until the shoulders have passed the outlet, as they often cause, or increase the laceration. In multiparæ it is seldom necessary to do more than is laid down in directions 4 and 5.

It sometimes happens that the greatest amount of rigidity is situated in the free edge of the perineum; and if this tough margin be divided the exit of the head immediately follows. Such an operation was recommended by Ould ('Midwifery,' p. 145), and has been revived in recent years, as though it were quite a novel suggestion. Suture of the perineum, in cases of extensive laceration, was also recommended by the same author, and by others of much earlier date (Raynalde, &c.), and this proceeding, after falling into disuse for a long time, has of late years very properly come to be looked upon as an established practice. I have occasionally incised the perineum with manifest advantage, but the operation is one I am not at all partial to, and for this reason: that I have so often seen the perineum escape laceration where this accident had seemed inevitable, that it has made me doubt the possibility of recognising the cases where incision is an absolute necessity. Suturing the perineum should never be omitted where it has sustained any considerable tear. The best time for its performance is after the expulsion of the placenta and when the risk of hæmorrhage is over. I find that a curved needle, held at right angles

by a strong forceps (made for the purpose) is the best contrivance for carrying the hemp ligature, which in my opinion is preferable to wire. The sutures may be left in for four or five days, but will sometimes require earlier removal in consequence of the pains they occasion.

Dr. M. Duncan has drawn attention ('Ed. Med. Jour.,' March, 1876) to laceration of the proper vaginal orifice, and to its frequent and almost inevitable occurrence posteriorly, in all primiparous births. The tear, though it may lead on to laceration of the perineum, is nevertheless quite independent of it. The most important tears of the part, however, are at its anterior margin, this special importance arising from the hæmorrhage which they occasionally produce. If the rent extend into the adjacent nymphæ or the clitoris, very considerable, or even fatal, hæmorrhage may ensue, as I have myself more than once seen, and of which many examples are referred to by Dr. A. Macan, in his Report on Midwifery ('Dub. Med. Jour.,' November, 1875). Among the predisposing causes of all these lacerations I would give the most prominent place to constitutional syphilis, and to local inflammation; but, the relative size of the orifice and of the head, and the rapidity of the delivery, have much to do in the production of the laceration.]

If the child be surrounded with a large quantity of waters, (see Tab. IX, X, XI,) the uterus cannot come in contact with the body of it; but at every pain the membranes are pushed down by the fluids they contain, and the mouth of the womb being sufficiently opened by this gradual and repeated distension, they are forced into the middle of the vagina; then the uterus contracts and comes in contact with the body of the child, and, if it be small the head is propelled with the waters. Here the membranes usually break; but if that is not the case, they are pushed along towards the os externum, which they also gradually open, and appear on the outside in the form of a large round bag: meanwhile, the head advances, and the os externum being by this time fully dilated, is also protruded; when, if the membranes, instead of bursting in the middle of the protuberance, are tore all round at the os externum, the

child's head is covered with some part of them, which goes under the name of the caul, or king's hood. If the placenta is at the same time separated from the uterus, and the membranes remain unbroken, the secundines, waters, and child, are delivered together; but if the placenta adheres, they must of course give way; and should they be tore all around from the placenta, the greatest part of the body, as well as the head of the child, will be enveloped by them, from which it must be immediately disengaged, that the air may have a free passage into the lungs.

When the head is large, so that it does not descend immediately into the pelvis, the membranes are forced down by themselves, and being stretched thinner and thinner give way, when all the waters which are farther advanced than the head run out; then, the uterus coming in contact with the body of the child, the head is squeezed down into the mouth of the womb, which it plugs up so as to detain the rest of the waters. See Tab. XII, XIII.

Sometimes when the quantity of waters is very small, and the uterus embraces the body of the child, the head, covered with the membranes, is forced downwards, and gradually opens the os internum; but at its arrival in the middle of the pelvis and vagina, part of the waters will be pushed down before it, sometimes in a large and sometimes in a small proportion, towards the back part of the pelvis. At other times, when the waters are in small quantity, no part of them are to be distinguished farther than the head, which descending lower and lower, the attenuated membranes are split upon it; while at the same time it fills up the mouth of the womb and upper part of the vagina in such a manner as hinders the few remaining waters from being discharged at once; though in every pain a small quantity distils on each side of the head, for lubricating the parts, so as that the child may slip along the more easily. See Tab. XIII.

The uterus contracts; the pains become quicker and stronger; the crown of the head is pushed down to the lower part of the pelvis, against one of the ischia, at its lower extremity; the fore-head, being at the upper part of the opposite ischium, is forced into the hollow of the under part of the sacrum, while the vertex and hind-head is pressed below the os pubis, (see Tab. XIV,) from whence it rises in a quarter-turn, gradually opening the os externum; the frænum labiorum, or fourchette, perineum, fundament, and the parts that intervene betwixt that and the extremity of the sacrum, are all stretched outwards in form of a large tumour. The perineum, which is commonly but one inch from the os externum to the anus, is now stretched to three, the anus to two, and the parts between that and the coccyx are stretched from two inches to about three or more. The broad sacro-sciatic ligaments, reaching from each side of the lower part of the sacrum, to the under part of each ischium, are also outwardly extended, and the coccyx is forced backward; while the crown of the head, where the lambdoidal crosses the end of the sagittal suture, continues to be pushed along, and dilates the os externum more and more. See Tab. XV, XVIII.

When the head is so far advanced that the back part of the neck is come below the under part of the os pubis, the forehead forces the coccyx, fundament, and perinæum, backwards and downwards; then the hind-head rises about two or three inches from under the pubes, making an half-round turn in its ascent, by which the forehead is equally raised from the parts upon which it pressed, and the perineum escapes without being split or torn; (see Tab. XIX): at the same time, the shoulders advance into the sides of the pelvis at its brim where it is widest, and, with the body, are forced along and delivered; meanwhile, by the contraction of the uterus, the placenta and chorion are

loosened from the inner surface to which they adhered, and forced through the vagina, out at the os externum.

When the head rests at first above the brim of the pelvis, and is not far advanced, the fontanel may be plainly felt with the finger, commonly towards the side of the pelvis; this is the place where the coronal crosses the sagittal suture, and the bones are a little separated from each other, yielding a softness to the touch, by which may be distinguished four sutures, or rather one crossing another. These may be plainly perceived, even before the membranes are broke: yet the examination must not be made during a pain, when the membranes are stretched down and filled with waters; but only when the pain begins to remit, and the membranes to be relaxed; otherwise they may be broke too soon, before the os internum be sufficiently dilated, and the head properly advanced.

When the vertex is come lower down, the sagittal suture only is to be felt; because, as the hind head descends in the pelvis, the fontanel is turned more backwards to the side, or towards the concavity of the sacrum; but, after it has arrived below the under part of the ossa pubis, the lambdoidal may be felt crossing the end of the sagittal suture, the occiput making a more obtuse angle than that of the parietal bones, at the place where the three are joined together. But all these circumstances are more easily distinguished after the membranes are broke, or when the head is so compressed that the bones ride over one another, provided the hairy scalp be not excessively swelled. See Collect. XIV, and Tab. XIII, XIV, XVI, XVII, XVIII.

Sect. 3. Numb. 1.—*How and when to break the Membranes.*

I have already observed, that if the child be surrounded with a large quantity of waters, the uterus cannot come in contact with the body, so as to press down the head, until the membranes are pushed a considerable way before it into the vagina; nor even then, until they are broke, and the fluid diminished in such a manner as will allow the womb to contract, and, with the assistance of the pains, force along the child. When the membranes, therefore, are strong or unadvanced, and continue so long unbroke that the delivery is retarded, provided the os internum be sufficiently dilated, they ought to be broke without further delay, especially if the woman hath been much fatigued or exhausted with labour, or is seized with a violent flooding, in which case the rupture of the membranes hasten delivery, and the hæmorrhagy is diminished by the contraction of the uterus, which lessens the mouth of the vessels that are also compressed by the body of the child.

The common method of breaking the membranes is by thrusting the fingers against them when they are protruded with the waters during the pain, or by pinching them with the finger and thumb; but if they are detained too high to be managed in either of these methods, the hand may be introduced into the vagina, if the os externum is so lax as to admit it easily; and if this cannot be done without giving much pain, the fore and middle fingers being pushed into the vagina with the other hand, let a probe or pair of pointed scissors be directed along and between them, and thrust through the membranes when they are pushed with the waters below the head. This operation must be cautiously performed, lest the head should be wounded in the attempt; and as for the membranes, let the opening be

ever so small, the waters are discharged with force sufficient to tear them asunder.

[It was a just observation of Denman, "that there is infinitely more caution required, to avoid breaking the membranes too early, than there is difficulty in breaking them when necessary." In multiparæ there is no great judgment required as to the particular time for breaking the membranes, provided the presentation be favourable and the os uteri somewhat dilated and free from rigidity. But it is very different in the case of a primapara, and with such we should well consider the probable effects of the measure before putting it in practice, and bear in mind another very valuable maxim of the author last quoted—"that neither the mother or child is ever in any danger (except from hæmorrhage or convulsions) on account of the labour, before the membranes are broken." The discharge of the waters generally makes this difference in the condition of the case, viz.: (1.) It usually induces pains of a stronger and more expulsive character. (2.) Any delay in the labour cannot be borne so well by the mother or child, after, as before their discharge. (3.) A temporary suspension of the labour process (such as an opiate might induce) is more rarely advisable after the discharge of the liquor amnii. Nevertheless, even in first labours, it is sometimes needful to let off the waters on account of inert uterine action, or hæmorrhage. Churchill has laid down the proposition, and supported it by a large number of statistics, that "delay in the first stage involves very little if any danger, no matter how tedious it may be." ('Midwifery,' 5th edition, p. 260.) Of the truth of this I am fully convinced, provided the integrity of the membranes be included in the definition of the "first stage."]

Numb. 2.—*When little or no Waters are protruded.*

If the vertex, instead of resting at the side of the brim of the pelvis, or at the os pubis, is forced farther down to the os internum, and the waters happen to be in small quantity, the head is pushed forwards, and gradually opens the mouth of the womb without any sensible interposition of the waters; then it advances by degrees into the vagina,

and the membranes being split or tore, little or nothing is discharged until the body of the child be delivered; and, in this case, the hair of the head being plainly felt, will be a sufficient indication that the membranes are broke. If no hair is to be felt, but a smooth body presents itself to the touch, and the woman has undergone many strong pains, even after the mouth of the womb has been largely dilated, and the head forced into the middle of the pelvis, you may conclude that delivery is retarded by the rigidity of the membranes, that there is but a small quantity of waters, and that if the containing sacs were broke the head would come along without farther hesitation.

Sometimes no waters can be felt while the head is no further advanced than the upper part of the pelvis, because it plugs up the passage and keeps them from descending; but, as it advances downwards, the uterus contracts, and they are forced down in a small quantity towards the back-part; from thence, as the head descends, or even though it should stick in that situation, they are pushed farther down, and the membranes may be easily broke; but the task is more difficult when no waters come down, and the membranes are contiguous to the head. In this case, they must be scratched a little, during every pain, with the nail of a finger, which, though short and smooth, will by degrees wear them thinner and thinner, until they split upon the head by the force of labour. Yet this expedient ought never to be used until you are certain that delivery is retarded by their rigidity; for, if that be not the hindrance, the difficulty must proceed from the weakness of the woman, a large head, or narrow pelvis; in which case, the delivery is a work of time, and will be obstructed by the premature discharge of the waters, which, by gradually passing by the head, ought to keep the parts moist and slippery, in order to facilitate the birth; for, when the membranes are not broke, until the head is forced into the

middle of the pelvis, the largest part of it being then past the upper part of the sacrum, is commonly squeezed along, opens the os externum, and is delivered before all the waters are discharged from the uterus; so that what remains, by moistening and lubricating the parts, helps the shoulders and body to pass with more ease. When the membranes are too soon broke, the under part of the uterus contracts sometimes so strongly before the shoulders, that it makes the resistance still greater. See Collect. XV.

Numb. 3.—*How to manage when the Head comes down into the Pelvis.*

In most natural labours, the space betwixt the fore and back fontanels, viz. the vertex, presents to the os internum, and the forehead is turned to the side of the pelvis; because the basin at the brim is widest from side to side; and frequently, before the head is pushed in and fast wedged among the bones, the child (after a pain) is felt to move and turn it to that side or situation in which it is least pressed and hurt, if it was not presenting in that position before. But this position of the head may alter, viz. in those where it is as wide, or wider, from the back-part to the fore-part of the brim, than from side to side, the forehead may be turned backwards or forwards. But this form of the pelvis seldom happens.

This posture is always observed in a narrow pelvis, when when the upper part of the sacrum jets forward to the pubes; but as the child is forced lower down, the forehead turns into the hollow at the inferior part of the sacrum, because the vertex and occiput find less resistance at the lower part of the ossa pubis than at the ischium, to which it was before turned, the pelvis being at the pubes, as formerly described, no more than two inches in depth, whereas at the ischium it amounts to four. If, therefore,

the forehead sticks in its former situation, without turning into the hollow, it may be assisted by introducing some fingers, or the whole hand, into the vagina, during a pain, and moving it in the right position. See Chap. III. Sect. 4, No. 2.

When the head of the fœtus presents, and is forced along in any of those positions, the labour is accounted natural, and little else is to be done but to encourage the woman to bear down with all her strength in every pain, and to rest quietly during each interval; if the parts are rigid, dry, or inflamed, they ought to be lubricated with pomatum, hog's-lard, butter, or ung. altheæ; the two first are most proper for the external parts, and the two last (as being harder and not so easily melted) ought to be put up into the vagina to lubricate that and the os internum.

[Very brief instructions are here given for rectifying occipito-posterior positions of the head—a subject to which a good deal of attention has been directed of late years. Smellie seems to have been the first, or certainly among the very first obstetricians, to discover the possibility of artificially correcting these misplacements. Before his time the special treatment for them consisted in turning the child, as La Motte and Burton tell us; though the former of these authors had learned by experience that such was rarely necessary. To fully comprehend the extent of Smellie's own knowledge upon this subject, one should carefully read and compare his rules for using the forceps when the forehead is to the pubes (Chap. iii, Section 4, Number 2), and cases Nos. 258, 259, and 260, from all which it will be seen that he had a very correct general idea how this rectification was to be effected. With that candour and simplicity so characteristic of his nature, he tells us in Case 258 he chanced to come to the knowledge of this expedient, and how it "gave him great joy," and that his "eyes were opened to a new field of improvement on the method of using the forceps in this position."

Where the head has descended into the pelvis in the third or fourth position it is necessary to distinguish two varieties of misplacement in either case, depending on the degree of extension of

the head, or in other words, the distance the chin is removed from the chest. Where it is only slightly removed the anterior fontanelle will lie near to the cotyloid cavity, and hence Uvedale West, who has given the most careful attention to this subject,—calls this the *bregmato-cotyloid* variety; but if the head be somewhat more extended, and consequently the chin a little further removed from the chest, the forehead or root of the nose will lie towards the pubes; this he calls the *fronto-cotyloid* variety, and when so placed there is every reason to fear that the rotation of the head into an occipito-anterior position is not likely to take place spontaneously.

Any attempt to rectify this malposition is seldom advisable early in the labour and whilst the head is yet in the brim. It is when the head has reached the floor of the pelvis that the rectification can generally be tried with a prospect of success. In doing this it is not enough, as some writers suppose, to try and force the head to rotate in the direction that would bring the occiput by the shortest route to the front of the pelvis; but we must at the same time endeavour to push up the forehead and simultaneously pull down the occiput, and in doing the latter we may be very materially assisted, as West clearly points out, by the careful employment of the rectis. I have sometimes been astonished at the ease and rapidity with which the rotation, and in consequence the extraction of the head has been accomplished under the circumstances just described, by the aid of one blade of the straight forceps; but I generally applied it on the side of the head next pubes. In making these attempts—whether with the hand or instrument—to redress the head, we must never lose sight of the fact that the movement of primary importance to be given to the head, is, pushing up the forehead; or what is equivalent thereto, drawing down the occiput; for by so doing we favour that flexion of the head which is such an important mechanical condition for its transposition.]

Numb. 4.—*How to assist in Lingering Labours when the Parts are rigid.*

The mouth of the womb and os externum, for the most open with greater difficulty in the first than in the succeeding labours, more especially in women turned of thirty.

In these cases, the os externum must be gradually dilated in every pain, by introducing the fingers in form of a cone, and turning them round, so as to stretch the parts by gentle degrees; and the whole hand being admitted into the vagina, it will be sometimes found necessary to insinuate the fingers with the flat of the hand between the head and os internum; for when this precaution is not taken in time, the os uteri is frequently pushed before the head (especially that part of it next the pubes), even through the os externum; or if the head passes the mouth of the womb, it will protrude the parts of the os externum, and will endanger a laceration in the perinæum. This dilatation, however, ought to be cautiously performed, and never attempted except when it is absolutely necessary; even then it must be effected slowly, and in time of a pain when the woman is least sensible of the dilating force.

When the labour happens to be lingering, though everything be in a right posture, if the assistants are clamorous, and the woman herself too anxious and impatient to wait the requisite time without complaining, the labour will be actually be retarded by her uneasiness, which we must endeavour to surmount by arguments and gentle persuasion; but if she is not to be satisfied, and strongly impressed with an opinion that certain medicines might be administered to hasten delivery, it will be convenient to prescribe some innocent medicine that she may take between whiles, to beguile the time and please her imagination; but if she is actually weak and exhausted, it will be necessary to order something that will quicken the circulating fluids, such as preparations of amber, castor, myrrh, volatile spirits, the *pulv. myrrh. composit.* of the London, or *pulv. ad partum* of the Edinburgh Pharmacopœia, with everything in point of diet and drink that nourishes and strengthens the body. If the patient is of a plethoric habit, with a quick, strong pulse, the contrary method is to be

used, such as venæsection, antiphlogistic medicines, and plentiful draughts of weak, diluting fluids. See Collect. XVII, XVIII.

[Manual dilatation of the os uteri is very rarely advisable, and still more rarely practicable where actual rigidity of the part exists. After describing the procedure, our author gives the salutary injunction that "it ought to be cautiously performed, and never attempted except when it is absolutely necessary." We must bear in mind that the opening of the mouth of the womb to the required extent is the result partly of relaxation and partly of mechanical dilatation. Where the former is wanting means should be used to induce dilatation, and for this purpose the most efficient are (1), bleeding; (2) warm hip bath; (3) tartar emetic; (4) opiates; (5) chloroform. Upon each of these I would make a few cursory remarks. Smellie recommended and practised bleeding from the arm in patients "of a plethoric habit with a quick strong pulse." Dewees it was who gained for the lancet the highest repute as a remedy for rigidity of the os uteri; and I am very confident it is not now resorted to as often as its efficacy deserves. I have repeatedly bled patients on account of this unfavourable condition of the os, and oftentimes with signally beneficial results. In Dr. Hardy's and my 'Practical Observations on Midwifery,' &c., we give the result of our hospital experience of the use of this remedy, and we there state that "in point of efficacy bloodletting is certainly entitled to the first place, though it is not perhaps so generally admissible as tartar emetic," in the class of cases now under consideration. The warm hip bath is another excellent relaxant, and has these special advantages, viz.: it is always obtainable; is not met by the same prejudiced opposition as is the lancet; is always grateful and soothing to the patient; and never does any harm—at least I have never known harm from its use, and have on innumerable occasions seen it act efficaciously and speedily. The patient may sit in it for twenty, thirty, or forty minutes. The use of tartar emetic in these cases was first noticed, I believe, by Dr. Langley, in the year 1834 ('Lond. Med. and Surg. Jour.,' v, 189), but it was brought into more prominence by the Memoir of Dr. Evory Kennedy ('Dub. Med. Jour.,' x, 140, A.D. 1836). Of its value I can, from large experience, speak very highly; but it should not be given if sickness of stomach is already present, or if the bowels are constipated. It should be given, as Kennedy recom-

mended, in doses of one sixth or one eighth of a grain, with a few drops of Battley's liquor opii, every hour. As I have already hinted I am not fond of administering opiates in labour after the discharge of the waters. If the pains be frequent, the os uteri thin, and the head pressing strongly upon it, an anodyne enema will sometimes have a most beneficial effect. Chloroform inhalation I frequently employ in these cases and find it very serviceable by giving the patient rest, and moderating the frequency of the pains; but, once we commence its employment the difficulty is to withhold it. The hydrate of chloral has of late been recommended, but if, as Schroeder affirms, it augments the pains, its suitability may fairly be questioned.

In occipito-posterior positions of the head the dilatation is very apt to be retarded from the want of the wedge-like action of the bag of membranes or of the occiput; and here the hydrostatic bag of Barnes may do some good; and as a mechanical means of dilatation it is far superior (in these cases) to the hand; but there being no actual rigidity, the *Tincture of Time* is generally sufficient for their successful treatment; and this virtually is the same remedy that Smellie prescribes under the name of "some innocent medicine." Cases of insuperable rigidity of the os uteri (to borrow the title given to them by Dr. Lever) do occasionally occur and cause much perplexity as to their proper treatment. Such a case I saw very recently in consultation. The lady was over forty years of age, and a primipara. She had been ninety hours in labour, during most of which period the waters were evacuated. The os had been two thirds dilated for many hours. There was unequivocal evidence of the child's death, so that immediate delivery with the perforator and crotchet was resolved on, and accomplished without much trouble. She made a very good recovery.

It is of great importance to make sure that the delay really arises from the resistance offered by the uterine orifice, and not from any want of dilating force applied to it. On some rare occasions the rigidity of the os uteri has been so great that eventually the entire ring of the os was detached by a circular laceration. Of this accident examples have been recorded by Scott ('Med.-Chir. Trans.,' xi); Lever ('Guy's Hosp. Reports,' October, 1845); Steidele ('Wassenberg's Diss.'); Carmichael ('Dub. Med. Jour.,' xvi, 62); Evory Kennedy (ibid., xv, 503); Barker ('Lond. Obstet. Trans.,' ii, 329), and others. In the Museum of the Dublin Lying-in Hospital is the

preparation of an os uteri so detached. I cannot agree with the author last named in supposing that this separation is the result of pressure exerted by the fœtal head and pelvic brim, upon the os uteri; for this circle of pressure must be either above or below the attachment of vagina to the uterus; if above, then rupture of the uterus with its fatal consequences must ensue; and if below the laceration, should involve the vagina equally with the cervical portion of uterus.

Incision of the os uteri, in cases of insuperable rigidity, is indicated where dilatation is impracticable, and the fœtus living. Experience does not confirm the apprehensions of danger from hæmorrhage, or from extension of the tear to the body of the uterus; and the operation has been strongly recommended by Depaul, Lever, Ashwell, Murphy, Power, and many others, and has been successfully practised by Lever (loc. cit.); Tweedie ('Guy's Hosp. Reports,' iv, 119); Ashwell (ibid.); Buckminster ('Amer. Med. Jour.,' October, 1847); Pagan ('Ed. Monthly Jour.,' August, 1854); Gardner ('Amer. Jour.,' October, 1847); Butler ('Med. Gaz.,' xx, 589), and myself.

Our author, himself, records two cases, Nos. 389 and 396, where he "snipped" the thin rigid os uteri with a scissors. Both these patients died; but it would not be fair to attribute this result to the incision of the os, as each had severe hæmorrhage before delivery, and in each turning was performed under very unfavourable circumstances. Commenting on the second of these cases (and again on case 441) he observes that his previous experience showed a few cases where a thicker os uteri had been torn by the hand, and the women recovered; and it was the recollection of these cases which encouraged him to practise incision. I have on a few occasions distinctly felt the os uteri tearing under the finger, and without any unpleasant result supervening, whilst the passage of the head, which had been delayed by the unyielding condition of the part, speedily took place. The application of long forceps has been recommended by Dr. G. Johnston in some of these cases, in preference to incision, and he shows good results from the practice.]

NUMB. 5.—*How to behave when the Birth is obstructed by the navel-string of the Child, or a narrow Pelvis.* (See Book II, Chap. II, sect. 3.)

Although the head is pushed down into the pelvis, and

the vertex employed in opening the os externum, the forehead being lodged in the concavity formed by the coccyx and lower part of the sacrum; yet frequently, after the labour-pain is abated, the head is again withdrawn, by the navel-string happening to be twisted round the neck; or when the shoulders, instead of advancing, are retarded at the brim of the pelvis, one resting over the ossa pubis, while the other is fixed at the sacrum; or when (the waters having been long evacuated) the under part of the uterus contracts round the neck and before the shoulders, keeping up the body of the child.

When the head is therefore drawn back by any of these obstacles, and the delivery hath been retarded during several pains, one or two fingers being introduced into the rectum before the pain goes off, ought to press upon the forehead of the child at the root of the nose, great care being taken to avoid the eyes: this pressure detains the head till the return of another pain, which will squeeze it farther down, while the fingers pushing slowly and gradually turn the forehead half round outwards and half round upwards. By this assistance, and the help of strong pains, the child will be forced along, although the neck be entangled in the navel-string; for as the child advances the uterus contracts, and consequently the placenta is moved lower; the funis umbilicalis will also stretch a little, without obstructing the circulation.

The head being thus kept down, the shoulders too are pressed in every succeeding pain until they are forced into the pelvis, when the whole comes along, without further difficulty. And this expedient will, moreover, answer the purpose, when the under part of the uterus or the os internum is contracted round the neck of the child, and before the shoulders; also, when the head is very low, pressing a finger on each side of the coccyx externally, will frequently assist in the same manner; also, in lingering

cases, when the woman is weak, the head large, or the pelvis narrow, you may assist the delivery by gently stretching both the os externum and internum with your fingers, in time of the pains, which will increase the same, as well as dilate; but this is only to be done when absolutely necessary, and with caution and at intervals, for fear of inflaming or lacerating the parts.

[Stretching the os externum with the fingers, Smellie says, is "only to be done when absolutely necessary." In my experience (which has been pretty extensive) I have never yet deemed it absolutely necessary, and accordingly have never practised it. If the propulsion of the head be inadequate to dilate the part after diligently fomenting it, and the administration of chloroform, incision would most probably be required.]

Over and above these obstacles, the head may be actually delivered, and the body retained by the contraction of the os externum round the neck, even after the face appears externally. In this case it was generally alleged that the neck was close embraced by the os internum; but this seldom happens when the head is delivered, because then the os internum is kept dilated on the back-part and sides by the breast and arms of the fœtus, unless it be forced low down with or before the head.

When the head is delivered, and the rest of the body retained from the largeness or wrong presenting of the shoulders, or by the navel-string's being twisted round the body or neck of the child, the head must be grasped on each side, the thumbs being applied to the occiput, the fore and middle fingers extended along each side of the neck, while the third and fourth of each hand support each side of the upper jaw: thus embraced, the head must be pulled straight forwards; and if it will not move easily along, the force must be increased, and the direction varied from side to side, or rather from shoulder to shoulder, not by sudden jerks, but with a slow, firm, and equal motion. If the

body cannot be moved in this manner, though you have exerted as much force as possible without running the risk of over-straining the neck, you must endeavour to slip the turns of the navel-string over the head. But should this be found impracticable, you ought not to trifle in tying the string at two places, and cutting betwixt the ligatures, as some people have advised : such an operation would engross too much time; besides, the child is in no danger of suffocation from the stricture of the funis, because it seldom or never breathes before the breast is delivered.

[I must dissent from this last statement. The compression of the thorax prevents the child respiring, and therefore, an interruption of the funic circulation is scarcely less dangerous at this time than it would be at any previous period of fœtal life.]

The better method is, immediately to slide along one or two fingers, either above or below, to one of the arm-pits, by which you try to bring along the body, while with the other hand you pull the neck at the same time : if it still continues unmoved, shift hands, and let the other arm-pit sustain the force ; but if this fail, cut the navel-string, and tie it afterwards. If the shoulders lie so high that the fingers cannot reach far enough to cut or take sufficient hold, let the flat of the hand be run along the back of the child : or should the os externum be strongly contracted round the neck, push up your hand along the breast, and pull as before ; and should this method fail, you must have recourse to the blunt hook introduced and fixed in the arm-pit, but this expedient must be used with caution, lest the child should be injured or the parts lacerated.

The child being born, the funis umbilicalis must be divided, and the placenta delivered, according to the directions that will occur in the sequel. See Collect. XIX, XX, XXI, XXII.

[In a child of ordinary conformation, and not distended from putrefaction, I have very rarely experienced any serious difficulty in extracting the shoulders. Traction on the neck aided by a finger

in the axilla has always sufficed to bring the shoulders and body through the outlet. In women with shallow pelves, and when delivery has been hastened, I have on some occasions met with great resistance in extracting the thorax; and this appeared to have been caused by a shoulder hitching on the pubes; in other cases, it seemed that the shoulders did not make the proper turn at the outlet, and this is probably what Smellie means by "wrong presenting of the shoulders." If the child be dead and the pelvis contracted, the use of the blunt hook or crotchet would be justifiable and serviceable.]

Sect. 4.—Numb. 1.—*How to manage the Child after Delivery.*

The child being delivered, ought to be kept warm beneath the bed-cloaths, or immediately covered with a warmed flannel or linen cloth: if it cries and breathes, the umbilical cord may be tied and cut, and the child delivered to the nurse without delay; but if the air does not immediately rush into the lungs, and the circulation continues between it and the placenta, the operation of tying and cutting must be delayed, and everything tried to stimulate and sometimes to give pain. If the circulation is languid, respiration begins with difficulty, and proceeds with long intervals; and if it be entirely stopped in the funis, the child, if alive, is not easily recovered: sometimes a great many minutes are elapsed before it begins to breathe. Whatever augments the circulating force, promotes respiration; and as this increases, the circulation grows stronger, so that they mutually assist each other. In order to promote the one and the other, the child is kept warm, moved, shaken; whipt; the head, temples, and breast rubbed with spirits, garlic, onion, or mustard, applied to the mouth and nose; and the child has been sometimes recovered by blowing into the mouth with a silver canula, so as to expand the lungs.

When the placenta is itself delivered, immediately or soon after the child, by the continuance of the labour-pains, or

hath been extracted by the operator, that the uterus may contract so as to restrain too great a flooding; in this case, if the child has not yet breathed, and a pulsation is felt in the vessels, some people (with good reason) order the placenta, and as much as possible of the navel-string, to be thrown into a basin of warm wine or water, in order to promote the circulation between them and the child; others advise us to lay the placenta on the child's belly, covered with a warm cloth; and a third set order it to be thrown upon hot ashes: but of these the warm water seems the most innocent and effectual expedient.

Nevertheless, if the placenta is still retained in the uterus, and no dangerous flooding ensues, it cannot be in a place of more equal warmth while the operator endeavours, by the methods above described, to bring the child to life. See Collect. XXIII.

[It is always desirable to know as soon as possible after birth whether the child be alive or not; and the stethoscope yields the most certain and reliable information on this important point. I never but once saw a child resuscitated in whom the cardiac pulsations were inaudible; and I have seen very many children who could not be reanimated although the heart continued to beat for a considerable time. Cold aspersion, the warm bath, rapid friction with warm flannels, and the "ready method" of effecting artificial respiration, are the chief means on which I ordinarily rely to stimulate the dormant powers of life. Electro-magnetism is no doubt a valuable auxiliary, but it is rarely at hand to be available. As long as the faintest beat can be detected in the heart, so long should we persevere in our endeavours at resuscitation; success will occasionally reward our diligence. Artificial respiration by blowing through a catheter into the mouth of the child, whilst the nostrils are compressed and the mouth kept closed around the instrument, sometimes succeeds when other means fail; and the supposed danger of inducing emphysema of the lung has been shown by Arneth, of Vienna, to be very remote; for he found by direct experiment, that it required very strong force to produce rupture of the air-cells. ('Die Geburtshilfliche Praxis').]

Number 2.—*Death of Fœtus in Utero.*

In lingering labours, when the head of the child hath been long lodged in the pelvis, so that the bones ride over one another, and the shape is preternaturally lengthened, the brain is frequently so much compressed that violent convulsions ensue before or soon after the delivery, to the danger and oft-times the destruction of the child. This disorder is frequently relieved and carried off, and the bad consequences of the long compression prevented, by cutting the navel-string before the ligature is made, or tying it so slightly as to allow two, three, or four large spoonfuls to be discharged.

If the child has been dead one or two days before delivery, the lips and genitals (especially the scrotum in boys) are of a livid hue. If it hath lain dead in the uterus two or three days longer, the skin may be easily stript from every part of the body, and the navel-string appears of the same colour with the lips and genitals: if ten or fourteen days, the body is much more livid and mortified, and the hairy scalp may be separated with ease; and indeed, any part of the child which hath been strongly pressed into the pelvis, and retained in that situation for any length of time, will adopt the same mortified appearance.

Number 3.—*How to tie the Funis Umbilicalis.*

Different practitioners have used different methods of performing this operation; some proposing to tie and separate the funis before the placenta is delivered; to apply one ligature close to the belly of the child, with a view to prevent a rupture of the navel; and making another two inches above the former, to divide the rope between the two tyings: by the second ligature they mean to prevent a dangerous hæmorrhagy from the woman, pro-

vided the placenta adhercs to the uterus. But all these precautions are founded upon mistaken notions; and the following seems to be that which is casiest and best. If the placenta is not immediately delivered by the pains, and no flooding obliges you to hasten the cxtraction, the woman may be allowed to rest a little and the child to recover. If the child does not breathe, or the respiration is weak, let the methods above prescribed be put in practice with a view to stimulate the circulation; but if the child is livcly, and cries with vigour, the funis may be immediately tied in this manner:—Having provided a ligature or two composed of sundry threads waxed together, so as to equal the diameter of a pack-thread, being seven inches in length and knotted at each end, tie the navel-string about two fingers' breadth from the belly of the child, by making at first one turn if the funis be small, securing it with two knots; but if the cord be thick make two more turns and another double knot; then cut the funis with a pair of sharp scissors one finger's breadth from the ligature towards the placenta, and in cutting run the scissors as near as possible to the root of the blades, else the funis will be apt to slip from the edge and you will be obliged to make several snips beforc you can effect a separation; at the same time guard the point of the scissors with your other hand. The child being washed, a rag is wrapped round the funis, which, being doubled up along the belly, a square compress is laid over it, and kept firm or moderately tight with what the nurses call a *belly-band* or *roller* round the body.

This part of the funis soon shrinks, turns first livid, then black, and about the fifth day falls off close to the belly; and let the navel-string be tied in any part, or at any distance whatsoever from the belly, it will always drop off at the same place; so that ruptures in the navel seldom or never depend upon the tying of the funis, but may

happen when the compress and belly-band are not kept sufficiently firm and continued some time after the separation of the withered portion, especially in those children that cry much; the bandage ought always to be applied so slight as not to affect respiration.

The ligature upon the funis must always be drawn so tight as to shut up the mouths of the vessels; therefore, if they continue to pour out their contents another ligature must be applied below the former; for if this precaution be neglected the child will soon bleed to death; yet, if the navel-string is cut or tore asunder at two or three handbreadths from the belly, and exposed to the cold without any ligature, the arteries will contract themselves, so that little or no blood shall be lost; nay, sometimes, if the funis hath been tied and cut at the distance of three finger-breadths from the child's belly, so that it hath been kept from blooding for an hour or two, although the ligature be then untied and the navel-string and belly chaffed and soaked in warm water, no more blood will be discharged. See Collect. XXV.

Sect. 5.—*Of Delivering the Placenta.*

The funis being separated, and the child committed to the nurse, the next care is to deliver the placenta and membranes if they are not forced down by the labour-pains. We have already observed that if there is no danger from a flooding, the woman may be allowed to rest a little, in order to recover from the fatigue she has undergone, and that the uterus may in contracting have time to squeeze and separate the placenta from its inner surface; during which pause also, about one, two, or three cups full of blood are discharged through the funis from the vessels of the placenta, which is thus diminished in bulk, so that the womb may be more contracted; and

this is the reason for applying one ligature only upon the cord.

[For many years I have followed the practice here laid down, viz. of putting only one ligature on the cord, and cutting at the placental side of this ligature. If the child be alive or but recently dead, two or three ounces of blood will be discharged, the effect of which is to reduce the size of the placenta, and thereby to facilitate, in some slight degree, its passage through the os uteri. Schroeder, Greenhalgh and others suppose, however, that the contrary effect will ensue: but the placental mass, though somewhat lessened in size by the bleeding from the vein, still presents quite sufficient bulk and resistance for the uterus to act upon; and its structure is not perhaps quite so lacerable as when its vessels are in a turgid state. The second ligature might be advisable in a twin case, lest there should be any anastomosis between the vessels of the two fœtuses, in the common placenta.]

In order to deliver the placenta, take hold of the navel-string with the left hand, turning it round the fore and middle fingers, or wrapping it in a cloth, so that it may not slip from your grasp; then pull gently from side to side, and desire the woman to assist your endeavour by straining as if she were at stool, blowing forcibly into her hand, or provoking herself to retch by thrusting her finger into her throat. If by these methods the placenta cannot be brought away, introduce your hand slowly into the vagina, and feel for the edge of the cake, which, when you have found, pull it gradually along; as it comes out at the os externum take hold of it with both hands and deliver it, bringing away at the same time all the membranes, which, if they adhere, must be pulled along with leisure and caution.

When the funis takes its origin towards the edge of the placenta, which is frequently the case, the cake comes easier off by pulling than when the navel-string is inserted in the middle, unless it be uncommonly retained by its adhesion to the womb or by the strong contraction of the

os internum. If the funis is attached to the middle of the placenta, and that part presents to the os internum or externum, the whole mass will be too bulky to come along in that position; in this case you must introduce two fingers within the os externum and bring it down with its edge foremost.

When the placenta is separated by the contraction of the uterus, in consequence of its weight and bulk it is pushed down before the membranes, and both are brought away inverted.

[That this last is the natural mode of expulsion of the placenta, has been laid down by most systematic writers since Smellie's time. But the description is only exceptionally true. When there has been no pulling at the funis or other interference, the afterbirth comes down through the os uteri with the *edge* foremost, which may or may not be slightly folded on itself. Dr. Matthews Duncan has carefully investigated this process, and has arrived at the result just stated; and the correctness of his observations has been corroborated by the remarks of Von Ritgen, and of Dr. Lemser, as well as by my own experience during several years that I directed attention to this very point. From Smellie's observing how much more easy is the removal of the placenta by traction when the insertion of the funis is marginal instead of central, we can see that he was not far from the discovery of the true mechanism of the delivery of the after-birth.]

When part of the placenta hath passed the os internum, and the rest of it cannot be brought along by easy pulling, because the os uteri is close contracted round the middle of it, or part of it still adheres to the womb, slide the flat of your hand below the placenta through the os internum; and, having dilated the uterus, slip down your hand to the edge of the cake and bring it along; but if it adheres to the uterus push up your hand again, and having separated it cautiously deliver it as before.

If, instead of finding the edge or middle of the placenta presenting to the os externum or internum, you feel the mouth of the womb closely contracted, you must take hold

of the navel-string as above directed, and slide your other hand along the funis into the vagina; then slowly push your fingers and thumb, joined in form of a cone, through the os uteri, along the same cord, to the place of its insertion in the placenta; here let your hand rest, and feel with your fingers to what part of the uterus the cake adheres; if it be loose at the lower edge, try to bring it along; but if it adheres, begin and separate it slowly, the back of your hand being turned to the uterus, and the fore part of your fingers towards the placenta; and for this operation the nails ought to be cut short and smooth. In separating, press the ends of your fingers more against the placenta than the uterus; and if you cannot distinguish which is which, because both feel soft (though the uterus is firmer than the placenta, and this last more solid than coagulated blood), I say, in this case, slide down your fingers to its edge, and conduct them by the separated part, pressing it gently from the uterus, until the whole is disengaged. Sometimes, when part of it is separated, the rest will loosen and come along if you pull gently at the detached portion; but if this is not effected with ease, let the whole of it be separated in the most cautious manner; sometimes, also, by grasping the inside of the placenta with your hand, the whole will be loosened without further trouble. As the placenta comes along, slide down your hand and take hold of the lower edge, by which it must be extracted, because it is too bulky to be brought away altogether in a heap; and let it be delivered as whole as possible, keeping your thumb or fingers fixed upon the navel string, by which means laceration is often prevented.

When the woman lies on her back, and the placenta adheres to the left side of the uterus, it will be most commodious to separate the cake with the right hand; whereas the left hand is most conveniently used when the placenta adheres to the right side of the womb; but when it is

attached to the fore part, back, or fundus, either hand will answer the purpose.

That part of the uterus to which the placenta adheres is kept still distended, while all the rest of it is contracted.

The nearer the adhesion is to the os internum, the easier is the placenta separated, and *vice versâ*, because it is difficult to reach up to the fundus, on account of the contraction of the os internum and lower part of the womb, which are not stretched again without great force, after they have been contracted for any length of time.

When, therefore, the placenta adheres to the fundus, and all the lower part of the womb is strongly contracted, the hand must be forced up in form of a cone into the vagina, and then gradually dilate the os internum and inferior part of the uterus. If great force is required exert it slowly, resting between whiles that the hand may not be cramped, nor the vagina in danger of being tore from the womb; for in this case the vagina will lengthen considerably upwards.

While you are thus employed let an assistant press with both hands on the woman's belly, or while you push with one hand press with the other in order to keep down the uterus, else it will rise high up and roll about like a large ball, below the lax parietes of the abdomen, so as to hinder you from effecting the necessary dilatation.

When you have overcome this contraction and introduced your hand into the fundus, separate and bring the placenta along, as above directed; and should the uterus be contracted in the middle like an hour-glass—a circumstance that sometimes though rarely happens—the same method must be practised.

In every case, and especially when the placenta hath been delivered with difficulty, introduce your hand after its extraction, in order to examine if any part of the uterus be pulled down and inverted; and if that be the case push it up and

reduce it without loss of time; then clear it of the coagulated blood, which otherwise may occasion violent after-pains.

For the most part, in ten, fifteen, or twenty minutes, more or less, the placenta will come away of itself; and though some portion of it, or of the membranes, be left in the uterus, provided no great flooding ensues, it is commonly discharged in a day or two, without any detriment to the woman; but, at any rate, if possible, all the secundines ought to be extracted at once, and before you leave your patient, in order to avoid reflections.

I find that, both amongst the ancients and moderns, there have been different opinions and directions about delivering the placenta, some alleging that it should be delivered slowly, or left to come of itself; others, that the hand should be immediately introduced into the uterus, to separate and bring it away. Before we run into extremes of either side, it should be considered how nature of herself acts in these cases. We find, in the common course of labours, that not once in fifty or a hundred times there is anything more to be done than to receive the child. Some of the ancients have alleged that no danger happens on this account oftener than once in one thousand labours; and as nature is, for the most part, sufficient of itself in such cases, it is very rare, perhaps not once in twenty or thirty times, that I have occasion to separate, as it generally comes down by the common assistance of pulling gently at the funis, and the efforts of the woman. I also find that the mouth of the womb is as easily dilated some hours after delivery as at any other time; so, in my opinion, we ought to go in the middle way, never to assist but when we find it necessary; on the one hand, not to torture nature when it is self-sufficient, nor delay it too long, because it is possible that the placenta may sometimes, though seldom, be retained several days; for if the uterus should be inflamed from any accident, and the woman be

lost, the operator will be blamed for leaving the after-birth behind. See Collect. XXIII.

[Smellie's remarks throughout this section display on the whole sound sense and intimate practical knowledge. Pulling the funis and passing the hand into the womb, however, are manipulations which he seems, according to our present ideas, to have resorted to on slight occasions; though less frequently perhaps than most of his cotemporaries, William Hunter alone excepted.

I have found it a very good practice to give the patient some stimulant—a glass of port wine is what I usually prefer,—immediately after the birth of the child. It counteracts the tendency to nervous shock or depression, and is very grateful at this time to the feelings of most patients. I usually wait for the return of the pains, or until fifteen or twenty minutes have elapsed before making any internal examination for the placenta; and during this interval steady moderate pressure is maintained over the uterus. Following down the uterus with the hand, as the fœtus is being born, and keeping up this pressure until the placenta is expelled and the binder applied, has been the course pursued in the Dublin Lying-in Hospital since the Mastership of Joseph Clarke (1786 to 1793), and is now almost universally followed by all educated practitioners. This, and the slow extraction of the fœtus (as Charles White particularly insisted on), contribute most materially to the safe extrusion of the after-birth, and the prevention of hæmorrhage.

Every practitioner will admit how important it is to obviate as far as possible the necessity of introducing the hand for the placenta, as this proceeding is, *cæteris paribus*, far more dangerous than the introduction of the hand before the birth of the child, and for obvious reasons. Speaking from hospital experience, I would regard the manual extraction of the placenta as one of the most dangerous operations in midwifery.

Pulling the funis is for many reasons a most objectionable practice. A far safer and more efficacious way of getting off the placenta is that which has been practised from time immemorial at the Dublin Lying-in Hospital. It consists in pressing or squeezing off the after-birth by external compression of the uterus with the hand: not pressing the uterus against the spine, but grasping the fundus with the entire hand, and then squeezing it downwards in the axis of the pelvis.[1] Mr. Dease, of Dublin, writing in

[1] A minute description of this manipulation is given at page 221 of Dr.

1783, thus alludes to the mode of removing the after-birth:—"Should the detachment of the placenta not be effected in the usual time, it will be much facilitated by the operator's judiciously applying his hand to the region of the uterus, which he may excite to the necessary contraction by gentle friction," &c. ('Obs. on Midwifery,' Dublin, 1783.) This method—which may justly be called the "Dublin Method"—of expressing the placenta will be found in very many cases to obviate the necessity of its manual extraction. Even where it does not succeed of itself, it will often bring the edge of the placenta within reach of the finger, and thus enable us to hook it away, using at the same time a little traction on the cord: here we combine the *vis à tergo* with a moderate amount of the *vis à fronte*. Dr. Credé, of Leipsig, brought this method in 1860 prominently under the notice of German accoucheurs, at the meeting of the Association of Physicians and Naturalists, held at Königsberg in September of that year.[1] Since then the method has been largely tried, and its great efficiency attested by Abegg, Strassman, Goschler, Winckel, Grenser, and Spiegelberg.

In the absence of hæmorrhage how long should we wait before resorting to the manual extraction of the placenta? This period, as laid down by different authorities, varies from half an hour to four hours. I believe that the sooner the hand is introduced after delivery the less painful, difficult, and dangerous will the operation be,—as a general rule. Smellie rather contradicts himself on this point, for at one place he says, "I also find that the mouth of the womb is as easily dilated some hours after delivery as at any other time," whilst two pages before he remarks, "the os internum and lower part of the womb are not stretched again without great force after they have been contracted for any length of time." When I was assistant at the Lying-in Hospital (Dublin) the rule was to wait for two hours before introducing the hand; and of twenty-eight cases reported by Dr. Hardy and myself where this operation was performed ten died (op. cit., p. 250). In my private practice I have performed the same operation about ten times, and every patient recovered; which result I attribute in great measure to its earlier performance, as it was necessitated chiefly on account of hæmorrhage.

Hardy's and my 'Practical Observations on Midwifery' (Dublin, 1848). Of late years I delay the application of the binder till *after* the removal of the placenta.

[1] See paper by Dr. Eastlake in the sixth volume of 'Trans. Obstet. Soc. Lond.,' 1864.

That Smellie's management of the third stage of labour was not so successful as that now pursued is sufficiently shown by the frequency—"perhaps not once in twenty or thirty times,"—that he had to separate the placenta; whereas in the present day it is only about once in 200 cases that the introduction of the hand is required. His mode of managing the placenta was, however, very much in advance of that followed by the great obstetric authorities of the eighteenth century; and to rank him, as a recent writer has done, along with Chapman and Manningham in following the precepts of Celsus, and extracting the placenta immediately after the birth of the fœtus, is to do him a very great injustice. In the preceding section, as well as in his candid and judicious observations upon case 219, he cautions us against precipitation, and advises a moderate delay, and that "not till after having waited a considerable time," and tried various expedients should the hand be passed up to separate the placenta. Ould, it is true, had given similar instructions ten years previously, but Deventer, Lamotte, Burton, &c., were strongly in favour of the immediate extraction of the after-birth. Burton very properly condemns the prevalent practice of "tugging at the funis," and gives no less than seven reasons in favour of the immediate manual extraction of the placenta.

In performing this operation I generally prefer using the left hand (though not left-handed in the ordinary sense), as recommended long ago by Pugh ('Midwifery,' p. 9); because, as Roberton very clearly pointed out, it can be passed up so much more conveniently than the right, with the woman lying on her left side; and moreover we can very usefully employ the right hand at the same time, (as Pugh recommends), passing it up between the patient's thighs, steadying and compressing the uterus with it, and thus making both hands act in concert towards the accomplishment of our object. If there be much resistance from contraction of the os uteri, chloroform will aid in relaxing it.

The hand once through the cervix should be passed up to the fundus without delay. This is a good rule, and one which Dr. J. C. Douglas laid stress upon.[1] In bringing the placenta away it is best to keep it well in the grasp of the hand with the fingers around its *distal* edge: by so doing it is impossible it can break, or that any of it can be left

[1] "Observations on the Hour-Glass Contraction of the Uterus," 'Med. Trans. of Coll. Phys. Lond.,' vol. vi.

behind, which is very apt to happen if we attempt to pull or "claw" it away, trusting to its strength or tenacity to bear the strain. On this point I must differ from our author. In most cases of hour-glass contraction of the uterus, the seat of this spasmodic condition is the cervix, as Douglas pointed out: but I agree with Smellie that contraction of the uterus "in the middle like an hour-glass," is "a circumstance that sometimes though rarely happens." Douglas strongly maintains "that a placenta has rarely, if ever, been primarily retained by this cause," viz. hour-glass contraction. He represents it as "a secondary cause of detention: its formation being merely the result of the undecided manner in which the practitioner introduces, or attempts to introduce his hand, with the intent to extract a placenta that has been retained by one of the other two causes which I might denominate primary causes" (loc. cit.). Very lengthened experience has satisfied me of the general correctness of these views; and one of my reasons for not pulling the funis, or otherwise examining for the placenta, during the fifteen or twenty minutes succeeding delivery, is the fear of exciting spasm of the cervix, the placenta being probably still high up, and the body of the uterus in a relaxed or imperfectly contracted state—both which circumstances would predispose to the occurrence of spasm under very slight provocation. This practical rule I learned from my old obstetric teacher Dr. Johnson—a physician who along with immense clinical experience possessed remarkably sound judgment and great practical sagacity.[1]

No mention is made in this section about the application of a bandage or binder to the abdomen; but at page 201 and again in Book IV, chap. i, our author expresses his approval of some such contrivance, "to make a suitable compression." Authors have differed in their opinions as to the propriety of employing a binder at all, and also as to its composition; and even the judicious Denman strongly objected to its employment until six or seven days had elapsed from the time of delivery. In the Dublin Lying-in Hospital the binder has always been regarded as an indispensable part of the treatment, being put on by the doctor a few minutes after the delivery of the child or placenta. The material of which the binder is made is of small importance, provided it have the proper size and

[1] For a short biographic sketch of this eminent Dublin accoucheur, see 'Dub. Med. Quart. Jour.,' Feb., 1867. Johnson was master of the lying-in hospital 1839—1846, and I was one of his assistants.

be applied in the right way. Its width should be from the mamma to just *below* the trochanter, where it should closely encircle the thighs and be securely fastened: if this initial step in the operation of binding is properly done, the bandage cannot slide up or get displaced. Four or five other pins are then to be applied at intervals, drawing the binder as tightly as the patient can bear. During this operation she lies on her left side, with the body and legs perfectly straight. For the first few hours the binder contributes, I think, to the safety of the patient, and subsequently to her comfort and the restoration of her figure.]

CHAPTER III.

OF LABORIOUS LABOURS.

SECT. I.—*How Laborious Labours are occasioned.*

IN the foregoing sheets, which treat of natural labours, I have described the most easy and simple method of managing the woman, delivering the child, and extracting the placenta; but as it sometimes happens that we must use extraordinary assistance for the preservation of the woman or child, or both, I must proceed to give directions how to behave in the laborious births, which more frequently occur than the preternatural.

A general outcry hath been raised against gentlemen of the profession, as if they delighted in using instruments and violent methods in the course of their practice; and this clamour hath proceeded from the ignorance of such as do not know that instruments are sometimes absolutely necessary, or from the interested views of some low, obscure, and illiterate practitioners, both male and female, who think they find their account in decrying the practice of their neighbours. It is not to be denied that mischief has been done by instruments in the hands of the unskilful and unwary; but I am persuaded that every judicious

practitioner will do everything for the safety of patients before he has recourse to any violent method, either with the hand or instrument, though cases will occur in which gentle methods will absolutely fail. It is, therefore, necessary to explain those reinforcements which must be used in dangerous labours; though they ought by no means to be called in, except when the life of the mother or child, or both, is evidently at stake, and even then managed with the utmost caution. For my own part, I have always avoided them as far as I thought consistent with the safety of my patients, and strongly inculcated the same maxim upon those who have submitted to my instructions.

All those cases in which the head of the child presents and cannot be delivered in the natural way, described in Chap. II, sect. 2 (p. 206), of this book, are accounted more or less laborious, according to the different circumstances from which the difficulty arises; and these commonly are: First, great weakness, proceeding from the loss of appetite and bad digestion; frequent vomitings, diarrhœas or dysenteries, floodings, or any other disease that may exhaust the patient; as also the fatigue she may have undergone by unskilful treatment in the beginning of labour.

Secondly, from excessive grief and anxiety of mind, occasioned by the unseasonable news of sudden misfortune in time of labour, which often affect her so as to carry off the pains, and endanger her sinking under the shock.

Thirdly, from the rigidity of the os uteri, vagina, and external parts, which commonly happens to women in the first birth, especially to those who are about the age of forty, though it may be also owing to large callosities, produced from laceration or ulceration of the parts, or to glands and scirrhous tumours that block up the vagina.

Fourthly, when the under part of the uterus is contracted before the shoulders, or the body entangled in the navel-string.

Fifthly, from the wrong presentation of the child's head: that is, when the forehead is towards the groin or middle of the os pubis; when the face presents with the chin to the os pubis, ischium, or sacrum; when the crown of the head rests above the os pubis, and the forehead or face is pressed into the hollow of the sacrum; and, lastly, when one of the ears presents.

Sixthly, from the extraordinary ossification of the child's head, by which the bones of the skull are hindered from yielding as they are forced into the pelvis; and from a hydrocephalus or dropsy, distending the head to such a degree, that it cannot pass along until the water is discharged.

Seventhly, from a too small or distorted pelvis, which often occurs in very little women, or such as have been rickety in their childhood. See Collect. XXIV to XXX and Tab. XXVIII.

[The *seven* causes of difficult labours here enumerated, may very conveniently be reduced to *four* heads, viz.: 1. Inert or irregular uterine action; 2, rigidity of the soft parts; 3, disease of the soft parts; and 4, disproportion between the head and pelvis. This is the arrangement of Denman, and for simplicity, comprehensiveness, and practical utility, it has never been surpassed. Smellie next proceeds to lay down fundamental rules for the treatment of difficult labours. As to the exact time and mode of operating, it is only to be expected that the great advance of obstetric knowledge, and the wider range of our resources as compared with his, should lead us to deviate considerably from the rules he acted on. Of the pathological effects of unduly prolonged parturition, and of the symptoms which are developed in its course, and which in large measure guide the accoucheur as to the precise period when instrumental assistance is required; upon all these points our author gives little information in this part of his work, but the deficiency is supplied in the clinical histories which follow. Of the three alternatives, viz. version, forceps, and crotchet—available to him in difficult labours, we are very much struck by the frequency with which he selected version; and yet deliberately abstained from it under circumstances

which, in the present day, would lead many accoucheurs to prefer it, namely, where there existed narrowing of the pelvis. He tells us the reason of his objection to version in cases of disproportion. "You may bring down the body of the child, but the head will stick fast above, and cannot be extracted without the help of the forceps or crotchets." This opinion is reiterated further on when describing the management of face presentations.

We find some further remarks on this same subject appended to case 378, in answer to the inquiry of a medical friend, "Whether he (Smellie) thought it not always safer in rickety patients to turn the child?" and we beg of the reader to refer to them. The following cases also bear more or less directly upon this subject, and may be studied with advantage, viz. Nos. 312, 313, 315, 352, 363, 378, 381, 390, 391, 392, 401, 402, 404, 407, and 408. From these and other cases, it is plain that Smellie had very ample opportunities of forming a sound judgment upon the effects to mother and child, of delivery by the feet, where there is contraction of the pelvis, or unusual size of the fœtal head. His opinion, therefore, we may well suppose, was grounded on clinical experience, apart from any theoretical or preconceived notions; and hence it is the more entitled to our respect. Although he admits that, turning in narrow pelvis, was occasionally successful in his hands (*vide* cases 312, 313, 352 and 315), yet he gives a decided preference in these cases to the forceps. He does not seem fully to recognise the superiority the former possesses over the other alternative operation (supposing forceps to have failed)—craniotomy—by affording a chance, however slight, to the fœtus.

His unfavourable opinion of turning in cases of contracted pelvis must have had great weight with English accoucheurs, and have consequently led to the more frequent employment of the crotchet as an alternative measure.

La Motte speaks of turning in difficult labours from disproportion, and recommends its performance after due trials of the powers of nature to force down the head. But the first author, who distinctly recommended turning as an operation of election in cases of pelvic deformity, seems to have been Fielding Ould, in 1742. Three years prior to this, namely, in 1739, he turned a fœtus presenting with the head in a case of very marked contraction of the pelvis, and a result happened, the apprehension of which deterred Smellie from the adoption of this practice; viz., after the extraction of the body

and limbs, the head became immovably jammed in the brim. This much of the delivery cost Ould "two hours' excessive hard toil," but "had it been to save my own life," he adds, "I could not have brought away the head;" he therefore severed it from the body by twisting round the latter, and then set to work with his *terebra occulta* to get away the detruncated head, which at length he accomplished, and the patient made a good recovery. "This was," he remarks, "the most laborious operation I ever performed; though it was in the midst of the great frost, yet I sweated through all my clothes; and my left hand was so swelled that I could not make use of it rightly in ten days after." ('Midwifery,' p. 182.)

Burton (1751), Brudenel Exton (1753), and Pugh (1754), all recommended turning in cases where there is known to be disproportion, provided the conditions were present for its safe performance.[1] From about this period, the operation of turning in these cases became less frequent; and William Hunter's disapproval of the practice and the very cautious and qualified opinion pronounced upon it by Denman, tended still further to throw discredit on its efficacy. At a later period the artificial induction of labour, supplied a novel means of obviating the necessity of an operation for effecting delivery, and therefore diminished the number of cases in which such was imperatively called for. Since the revival of turning in narrow pelvis, in 1847, by Simpson, however, attention has been afresh directed to it, and clinical illustrations of its utility have multiplied on all sides. That turning is an expedient of great value, as regards both the mother and child, in cases of pelvic contraction, seems to be incontestably established; but its range of application is confined to cases of moderate contraction of the pelvis, the conjugate diameter of the brim being not less than three inches; though instances are not wanting in which the child was drawn through a considerably smaller diameter. Dr. Goodell, of Philadelphi, has pointed out how turning is chiefly of service when the narrowing is confined to the conjugate diameter; and he believes that in pelves that are uniformly contracted, the forceps is the better means of delivery. His reason for this is, that in delivering by the feet, there must be room enough in the bisiliac diameter of the pelvis for the occipito-frontal diameter of the unflexed head to

[1] For an admirable sketch of the fluctuations in opinion on turning and the long forceps, in cases of difficult labour, the reader will do well to refer to a paper by Dr. Charles West, in the 'London Medical Gazette,' Nov. 22, 1850.

pass. This transverse narrowing may be inferred, he adds, whenever a strongly flexed head lies obliquely, and yet does not engage or descend. ('Clinical Memoir on Turning in Pelvis narrowed in the Conjugate Diameter,' Philadelphia, 1875.) He also maintains that a brim which can admit the unyielding base of the head, is traversable by the crown.

Cases of moderate contraction of the brim are just the cases where the long forceps may also be used with good effect; and hence a sharp controversy has long been waged between the advocates of turning and of the forceps. Of course in any given case, much would depend on the skill and dexterity of the operator. But when we find such experienced operators as Barnes, Simpson, Braxton Hicks, and Goodell recording cases where, having utterly failed to deliver with the forceps, after a full and patient trial of the instrument, they, nevertheless, succeeded by turning, the practical conclusion is strongly in favour of the latter. But turning has this disadvantage, that if it fail, we cannot reverse our proceeding; whereas if the forceps fail, it is not necessarily too late to resort to version. There are certain circumstances which at the very onset would discourage or forbid turning: these are, the child being dead; the uterus strongly contracted around fœtus; the head locked in the brim; or the degree of pelvic narrowing being extreme.

It is surprising what powerful traction the neck of the living, or fresh fœtus, will bear without sustaining any serious injury. As the result of some carefully conducted experiments, Dr. Matthews Duncan has found that the force required to decapitate the fœtus is, on an average, about 120 pounds. But the vertebral column gave way when the weight or force was about 105 pounds, a further addition of about 15 pounds being required to complete the disseverment. ('Mechanism of Natural and Morbid Parturition.') Here then we see what is the tensile strength of the neck of a fresh adult fœtus. Dr. Goodell, indeed, relates a case (op, cit. p. 112) where he extracted a child, weighing five pounds six ounces, upon whose body he had exerted a traction force of "not under 110 pounds;" and yet the child was born alive, and "the mother's convalescence was so prompt that on the fifth day she was dressed, and on the twelfth went out as a wet nurse." Duncan's experiments have also shown us another important practical fact, namely, that either leg of the fœtus always proved stronger than the neck: hence we may exert on a single

leg a stronger pull than can be made, compatibly with the integrity of the neck.

Although ingenious mechanical arguments have been brought forward with much plausibility to show why the passage of the skull base foremost, should require a smaller conjugate diameter than when it comes vertex foremost; still I candidly avow my conviction that the great and chief advantage of turning in contracted pelvis, would seem to be this: that without any addition to the bulk of the head; and without any compressing force being applied to it other than that of the pelvis itself, which acts precisely on the cranial diameter requiring reduction,—an enormous tractive force—*à vis a fronte*—can be brought to bear on the fœtus; and that in addition to this, an external pressure—*à vis a tergo*—nearly equal to as much more (Goodell) can also be made on the fœtus. These two combined represent an enormous extractive force; and the real wonder is how it can be put in operation without inflicting serious injury on the maternal structures; but experience does not altogether justify our fears on this head. I can hardly think we could, by any other possible means, bring to our aid anything like an equal force to effect delivery. That the possession of this great power in delivery by the feet is the real source of gain in turning in narrow pelvis, is strongly corroborated by the remarks of the late Dr. Hugh Hodge, of Philadelphia, in his last contribution to obstetric literature (see (American) 'Journal of Obstetries' for May, 1875), in which he ably controverts two of the strongest theoretical arguments used by Simpson and his followers to prove the mechanical advantage of the base of the head first passing through a contracted brim. So far he only confirms the opinion I ventured to express in my 'Clinical Memoir on Turning in Cases of Disproportion,' read before the London Obstetrical Society in 1862: "I do not believe that the diameters of the head are more advantageously placed with regard to those of the pelvis, nor can I believe that the head is more compressible when entering the strait with its base, than when it does so with its vertex, till this be demonstrated by direct experiment." ('Trans. of Obstet. Society,' vol. iv, p. 186.)

But now supposing we have turned the child, and extracted the body and arms, but the head sticks fast in the brim and cannot be brought through by any amount of dragging,—is the patient, or is the operator in a worse position than if turning had not been performed? This, it will be seen, is the very contingency, the fear of

which deterred Smellie and others from adopting version in the class of cases under consideration. To the above question, I think a negative answer may justly be given. In the first place, turning before or soon after the rupture of the membranes, is generally a harmless operation for the mother,—one "entirely free from danger," Schroeder says; in the next place the duration of the labour process is, by its employment, much abridged, and the occurrence of bad symptoms anticipated; and lastly, simple perforation of the head will allow of the extraction being easily completed. Radford ('Prov. Med. Jour.,' 1847) and other opponents of turning have exaggerated the difficulty of perforating under these particular circumstances; but, on the other hand, they omit to mention how easy is the extraction once perforation is effected, whereas this is the most tedious and troublesome stage of the operation where the head comes first through the pelvis. Schroeder's third reason for recommending version in all cases of pelvic contraction where this is not absolute, is because "perforation of the after-coming head is neither more difficult nor more dangerous to the mother than of the presenting head." ('Manual of Midwifery,' p. 262.) The chances of saving the life of the child by this measure are no doubt but small. Of the *seventeen* cases reported in my 'Clinical Memoir on Turning in Cases of Disproportion' (loc cit.), *nine* of the children (four boys and five girls) were born alive,—that is they lived and breathed; whilst in *five* others the infants lived, for the fœtal heart continued to pulsate for some time after birth, but respiration could not be established. In none of these seventeen cases was there any considerable contraction of the pelvis; so that the above rate of mortality is probably much below what it would be in cases where the degree of disproportion was more marked.]

In all these cases, except when the pelvis is too narrow and the head too large, provided the head lies at the upper part of the brim, or (though pressed into the pelvis) can be easily pushed back into the uterus, the best method is to turn the child and deliver by the feet, according to the directions which shall be given in the sequel; but if the head is pressed into the middle or lower part of the pelvis, and the uterus strongly contracted round the child, delivery ought to be performed with the forceps; and in all the

seven cases, if the woman is in danger, and if you can neither turn nor deliver with the forceps, the head must be opened and delivered with the crotchets. Laborious cases, from some of the above recited causes, happen much oftener than those we call preternatural; but those which proceed from a narrow pelvis or a large head are of the worst consequence. These cases demand greater judgment in the operator than those in which the child's head does not present, because in these last we know that the best and safest method is to deliver by the feet, whereas in laborious births we must maturely consider the cause that retards the head from coming along, together with the necessary assistance required; we must determine when we ought to wait patiently for the efforts of nature, and when it is absolutely necessary to come to her aid. If we attempt to succour her too soon, and use much force in the the operation, so that the child and mother, or one of the two, are lost, we will be apt to reproach ourselves for having acted prematurely, upon the supposition that if we had waited a little longer the pains might have by degrees delivered the child, or at least forced the head so low as that we might have extracted it with more safety by the assistance of the forceps. On the other hand, when we leave it to nature, perhaps, by the strong pressure upon the head and brain, the child is dead when delivered, and the woman so exhausted with tedious labour, that her life is in imminent danger; in this case we blame ourselves for delaying our help so long, reflecting that had we delivered the patient sooner, without paying such scrupulous regard to the life of the child, the woman might have recovered without having run such a dangerous risk. Doubtless, it is our duty to save both mother and child if possible; but, if that is impracticable, to pay our chief regard to the parent; and, in all dubious cases, to act cautiously and circumspectly, to the best of our judgment and skill.

If the head is advanced into the pelvis, and uterus strongly contracted round the child, great force is required to push it back into the womb, because the effort must be sufficient to stretch the uterus, so as to re-admit the head, together with your hand and arm; and even then the child will be turned with great difficulty.

Should you turn when the head is too large you may bring down the body of the child, but the head will stick fast above and cannot be extracted without the help of the forceps or crotchets (see Tab. XXXV, XXXVI); yet the case is still worse in a narrow pelvis, even though the head be of an ordinary size. When things are so situated you should not attempt to turn, because in so doing you may give the woman a great deal of pain and yourself much unnecessary fatigue; you ought, therefore, to try the forceps, and if they do not succeed diminish the size of the head and extract it as shall be afterwards shown.

Sect. 2.—*Of the Fillet and the Forceps.*

We have already observed that the greatest number of difficult and lingering labours proceed from the head's sticking fast in the pelvis, which situation is occasioned by one of the seven causes recited above. When formerly this was the case the child was generally lost, unless it could be turned and delivered by the feet; or if it could be extracted alive, either died soon after delivery, or recovered with great difficulty from the long and severe compression of the head, while the life of the mother was endangered from the same cause as above described; for the pressure being reciprocal, the fibres and vessels of the soft parts contained in the pelvis are bruised by the child's head, and the circulation of the fluids obstructed, so that a violent inflammation and sometimes a sudden mortification ensues. If the child could not be turned the method

practised in these cases was to open the head and extract with the crotchet; and this expedient produced a general clamour among the women, who observed that when recourse was had to the assistance of a man-midwife, either the mother or child, or both, were lost. This censure, which could not fail of being a great discouragement to male practitioners, stimulated the ingenuity of several gentlemen of the profession, in order to contrive some gentler method of bringing along the head so as to save the child without any prejudice to the mother.

[The "censure" here alluded to was prevalent also in Hugh Chamberlen's time; for he tells us in the preface to his translation of Mauriceau (the date of which preface was 1672), that the practice of "fastening hooks in the head of a child in difficult labour, where it came right, has very much caused the report that when a man comes, one or both must necessarily die, and makes many for that reason forbear sending until either be dead or dying."]

Their endeavours have not been without success; a more safe and certain expedient for this purpose hath been invented, and of late brought to greater perfection in this than in any other kingdom, so that if we are called in before the child is dead, or the parts of the woman in danger of a mortification, both the fœtus and mother may frequently be happily saved. This fortunate contrivance is no other than the *forceps*, which was, as is alleged, first used by the Chamberlens, by whom it was kept as a nostrum, and after their decease so imperfectly known as to be seldom applied with success; so that different practitioners had recourse to different kinds of fillets or hooks. Blunt hooks also of various make were invented in England, France, and other parts. The forceps, since the time of Dr. Chamberlen, have undergone several alterations, particularly in the joining, handles, form, and composition.

The common way of using them formerly was by introducing each blade at random, taking hold of the head

anyhow, pulling it straight along, and delivering with downright force and violence; by which means both os internum and externum were often tore, and the child's head much bruised. On account of these bad consequences they had been altogether disused by many practitioners, some of whom endeavoured in lieu of them to introduce divers kinds of fillets over the child's head; but none of them can be so easily used or have near so many advantages as the forceps, when rightly applied and conducted, according to the directions, that shall be laid down in the next section.

Mr. Chapman, as mentioned in the introduction, was the first author who described the forceps, with the method of using them; and we find in the observations of Giffard several cases in which he delivered and saved the child by the assistance of this instrument. A forceps was also contrived at Paris, a drawing of which may be seen in the Medical Essays of Edinburgh, in a paper communicated by Mr. Butter, surgeon; but after Mr. Chapman had published a delineation of his instrument, which was that originally used by the Chamberlens, the French adopted the same species, which among them went under the denomination of *Chapman's forceps*. For my own part, finding in practice that by the directions of Chapman, Giffard, and Gregoire at Paris, I frequently could not move the head along without contusing it and tearing the parts of the woman; for they direct us to introduce the blades of the forceps where they will easiest pass, and, taking hold of the head in any part of it, to extract with more or less force according to the resistance; I began to consider the whole in a mechanical view, and reduce the extraction of the child to the rules of moving bodies in different directions. In consequence of this plan I more accurately surveyed the dimensions and form of the pelvis, together with the figure of the child's head and the manner in which it

passed along in natural labours; and from the knowledge of these things I not only delivered with greater ease and safety than before, but also had the satisfaction to find, in teaching, that I could convey a more distinct idea of the art in this mechanical light than in any other, and particularly give more sure and solid directions for applying the forceps, even to the conviction of many old practitioners, when they reflected on the uncertainty attending the old method of application. From this knowledge, too, joined with experience and hints which have occurred and been communicated to me in the course of teaching and practice, I have been led to alter the form and dimensions of the forceps, so as to avoid the inconveniences that attend the use of the former kinds. See Tab. XXXVII.

[A clear exposition of the mechanical principles which should guide us in the application and use of the forceps, was one of the most original features in Smellie's treatise, and his observations on this subject were a most valuable addition to obstetric knowledge. Till these fundamental rules were laid down and acted upon, the employment of the instrument was attended with uncertainty and danger. Long practice might enable a man to use it safely and properly by that incommunicable tact which experience begets; but the novice could never use the instrument with any degree of confidence or assurance of success. Though we may now—having more knowledge and more perfect instruments—sometimes deviate with advantage from Smellie's rules, still the observance of them is eminently calculated to insure the safe employment of the forceps; though, I admit, it tends also to restrict in some degree its range of applicability. Smellie foresaw that so potent an instrument was sure to be abused, and to guard against this as far as possible, he prepared a code of admirable instructions for the guidance of operators.]

The consideration of mechanics, applied to Midwifery, is likewise in no case more useful than when the child must be turned and delivered by the feet; because there we are principally to regard the contraction of the uterus, the position of the child, and the method of moving a

body confined in such a manner; but I have advanced nothing in mechanics but what I find useful in practice, and in conveying a distinct notion of the several difficulties that occur to those who are or have been under my instruction, for whom this treatise is principally designed.

The lacks or fillets are of different kinds, of which the most simple is a noose made on the end of a fillet or limber garter; but this can only be applied before the head is fast jammed in the pelvis, or when it can be pushed up and raised above the brim. The os externum and internum having been gradually dilated, this noose must be conveyed on the ends of the fingers, and slipped over the fore and hind-head. There are also other kinds differently introduced upon various blunt instruments, too tedious either to describe or use; but the most useful of all these contrivances is a fillet, made in form of a sheath, mounted upon a piece of slender whalebone about two feet in length, which is easier applied than any other expedient of the same kind. See Tab. XXXVIII.

When the head is high up in the pelvis, if the woman has been long in labour, and the waters discharged for a considerable time, the uterus being strongly contracted, so as that the head and shoulders cannot be raised or the child turned to be delivered by the feet, while the mother is enfeebled and the pains so weak, that, unless assisted, she is in danger of her life; also when the os internum, vagina, and labia pudendi, are inflamed and tumefied; or when there is a violent discharge of blood from the uterus, provided the pelvis is not too narrow nor the head too large, this fillet may be successfully used; in which case, if the os externum and internum are not already sufficiently open, they must be gradually dilated as much as possible by the hand, which at the same time must be introduced and passed along the side of the head, in order to ascertain the position thereof. This being known, let the other

hand introduce the double of the whalebone and fillet over the face and chin, where you can have the best purchase, and where it will be least apt to slip and lose its hold. This application being effected, let the hand be brought down, and the whalebone drawn from the sheath of the fillet, which (after the ends of it are tied together) must be pulled during every pain, pressing at the same time with the other hand upon the opposite part of the head, and using more or less force according to the resistance.

The disadvantage attending all fillets is the difficulty in introducing and fixing them; and though this last is easier applied than the others, yet when the vertex presents, the child's chin is so pressed to the breast that it is often impracticable to insinuate the fillet between them, and if it is fixed upon the face or hind head it frequently slips off in pulling. But, granting it commodiously fixed, when the head is large or the pelvis narrow, so that we are obliged to pull with great force, the fillet will gall, and even cut the soft parts to the very bone; and if the child comes out of a sudden, in consequence of violent pulling, the external parts of the woman are in great danger of sudden laceration; but if the head is small, and comes along with a moderate force, the child may be delivered by this contrivance without any bad consequence; though, in this case, we find by experience that unless the woman has some very dangerous symptom the head will in time slide gradually down into the pelvis, even when it is too large to be extracted with the fillet or forceps, and the child be safely delivered by the labour pains, although slow and lingering, and the mother seems weak and exhausted, provided she be supported with nourishing and strengthening cordials.

[Our author very fairly states the objections to the use of the fillet or lack; and it is these objections which have almost completely banished the fillet from the armamentarium of the obstetrician.

Pugh called all the kinds of fillets "but idle things." Dr. Merriman describes a case in which his uncle witnessed the employment of the fillet; and from many inquiries he made he thought that was the last time that the fillet, in natural presentations, was used in London. ('Synopsis,' &c., 3rd edit., p. 289.) There seems, however, to be a revival of the use of the instrument, as Dr. Barnes tells us he believes the fillet "is largely used by some practitioners and with great success." Dr. Westmacott brought a whalebone loop, or fillet, under the notice of the London Obstetrical Society, in July, 1869, of which he spoke very favourably from considerable experience of its use. ('Obstet. Trans.,' vol. xi.) In the eighth volume of the Transactions of the same Society, is a description of the steel fillet of Mr. Sheraton. Both these contrivances are ingenious, and no doubt possess a limited range of usefulness; but they possess no real advantage over the forceps, and there is no case of head presentation where the forceps could possibly fail of effecting as much as the fillet or loop. That they afford more facility than the forceps for being used clandestinely I do not deny; but whether this be any recommendation, admits of question. In giving a decided preference to the forceps over the fillet, Smellie shows a sound judgment, and anticipated the verdict of the profession as to the comparative merits of the two instruments. In the sentences which follow, he guards himself, however, against the charge of being influenced by any blind partiality for the forceps.]

From what I have said the reader ought not to imagine that I am more bigotted to any one contrivance than to another. As my chief study hath been to improve the art of midwifery, I have considered a great many different methods, with a view of fixing upon that which should best succeed in practice. I have tried several kinds of hooks, which have been from time to time recommended to me, and in particular the last mentioned fillet, which was communicated to me by the learned Dr. Mead in 1743. As this fillet could, in all appearance, be more easily introduced than any other, I for several years carried it with me when I was called in difficult cases, and sometimes used it accordingly; but I generally found the fixing of

this, as well as all other laeks, so uncertain, that I was obliged to have reeourse to the foreeps, which, being introdueed with greater ease, and fixed with more certainty, seldom failed to answer the purpose better than any other method hitherto found out; but let not this assertion prevent people of ingenuity from employing their talents in improving these or any other methods that may be safe and useful; for daily experienee proves that we are still imperfeet, and very far from the *ne plus ultra* of discovery in arts and seiences; though I hope every gentleman will despise and avoid the eharaeter of a selfish secret-monger.

As the head in the 6th and 7th cases is forced along the pelvis, eommonly in these laborious eases the bones of the cranium are so eompressed, that they ride over one another, so that the bulk of the whole is diminished, and the head, as it is pushed forward, is, from a round, altered into an oblong figure: when therefore it is advanced into the pelvis, where it stieks fast for a eonsiderable time, and cannot be delivered by the labour-pains, the forceps may be introdueed with great ease and safety, like a pair of artifieial hands, by whieh the head is very little (if at all) marked, and the woman very seldom tore. But if the head is detained above the brim of the pelvis, or a small portion of it only farther advanced, and it appears that the one being too narrow, or the other too large, the woman eannot be delivered by the strongest labour-pains: in that case the ehild cannot be saved, either by turning and bringing it by the feet, or delivered by the application of fillet or forceps; but the operator must unavoidably use the disagreeable method of extraeting with the crotehet. Nevertheless, in all these eases, the foreeps ought first to be tried; and sometimes they will suceeed beyond expectation, provided the birth is retarded by the weakness of the woman, and the second, third, fourth, or fifth obstructions. But they cannot be depended upon, even when the vertex pre-

sents, with the forehead to the side or back part of the pelvis, and (though the woman has had strong pains for many hours after the membranes are broke) the head is not forced down into the pelvis, or at least but an inconsiderable part of it resembling the small end of a sugar-loaf. For, from these circumstances, you may conclude, that the largest part of it is still above the brim, and that either the head is too large or the pelvis too narrow. Even in these cases, indeed, the last fillet, or a long pair of forceps, may take such firm hold, that with great force and a strong purchase the head will be delivered; but such violence is commonly fatal to the woman, by causing such an inflammation, and perhaps laceration, of the parts, as is attended with mortification. In order to disable young practitioners from running such risks, and to free myself from the temptation of using too great force, I have always used and recommended the forceps so short in the handles, that they cannot be used with such violence as will endanger the woman's life; though the purchase of them is sufficient to extract the head when one half or two thirds of it are equal to or past the upper or narrow part of the pelvis.

When the head is high the forceps may be locked in the middle of the pelvis; but in that case great care must be taken in feeling with the fingers all round, that no part of the vagina be included in locking. Sometimes, when the head rests, or is pressed too much on the fore-part or side of the pelvis, either at the brim or lower down, by introducing one blade it may be moved farther down, provided the labour-pains are strong, and the operation assisted by the fingers of the other hand applied to the opposite side of the head; but if the fingers cannot reach high enough, the best method is to turn or move the blade towards the ear of the child, and introduce the other along the opposite side.

In a narrow pelvis I have sometimes found the head of

the child thrown so much forward over the os pubis, by the jetting in of the sacrum and lower vertebra of the loins, that I could not push the handles of the forceps far enough back to include within the blades the bulky part of the head which lay over the pubes. To remedy this inconvenience, I contrived a longer pair, curved on one side, and convex on the other; but these ought never to be used except when the head is small; for, as we have already observed, when the head is large, and the greatest part of it remains above the brim, the parts of the woman may be inflamed and contused by the exertion of too much force. Nevertheless, this kind of forceps may be advantageously used when the face presents and is low down, and the chin turned to the sacrum; because, in that case, the occiput is towards the pubes, so that the ends of the blades can take firmer hold of the head; but then the chin cannot be turned below the pubes so easily with these as with the other kind, nor the hindhead be brought below these last bones. See Tab. XXVI.

[Smellie does not seem to have very early recognised the value of the forceps. From cases 277 and 390, we know that up to the year 1733 at all events, he was ignorant of its use. Chapman's work appeared in this very year, and probably was the source of his earliest information about the instrument. From what he states in case 281, I am led to suppose that even up to the year 1737, Smellie's experience of the forceps was very limited, for in this case he attempted delivery, under favourable circumstances, with a French forceps recommended by Mr. Butter ('Ed. Med. Essays'), but failed to extract the child.

Smellie caused the forceps to be made with *wooden* handles instead of the crooked metallic handles which the forceps of Chapman had. From case 381, we learn that he made this change in the construction of the handles some time later than the year 1746. He also contrived a particular kind of wooden forceps, with which he delivered three patients, as we gather from the remarks on case 269; but this is the only occasion on which he speaks of them, so that we may suppose the wooden instrument did not equal his expectations. Indeed, there is no wood which possesses sufficient strength and

tenacity, without giving the instrument so much bulk as to render it wholly useless. The wooden forceps led its inventor into a paper war; for a pamphlet appeared decrying the alleged improvement, and pointing out its "impropriety;" and this elicited a reply on the part of Smellie. To this controversy, I have alluded in the Memoir of Smellie (*vide* p. 22). That he himself, however, set no value on the instrument is best shown by what I have stated above. The form of instrument that Smellie chiefly, and for many years of his practice exclusively used, was a shorter and smaller forceps than that of Chapman, Giffard, or Pugh. About the year 1752, he lengthened the forceps and gave them the second or pelvic curve. (See case 315.) He does not appropriate to himself the merit of this improvement, but tells us (in case 352) that "they were contrived by himself as well as other practitioners, on purpose to take a better hold of the head when presenting and high up in the pelvis;" but he did not recommend their use in such cases "for fear of doing more harm than good." In fact he seems to have restricted their employment to extracting the head after the birth of the body (as in cases 347 and 352), and to cases of face presentation where the chin is to the sacrum. In connexion with the double curved forceps, I may just mention that Pugh was very partial to it, and states in the preface to his 'Midwifery' (published 1754) that he "invented it upwards of fourteen years ago." It is open to question, therefore, whether his claim to originality in this matter be not prior to that of Levret.

Smellie recommended that the blades of the forceps should be covered with leather; but for very many years back, nearly all obstetricians have dispensed with this most objectionable addition to the instrument, except Mr. Roberton, who had the tips covered with very thin leather. Burton saw the disadvantages of this leather covering, and exposed them very strongly.

One of the greatest improvements in the midwifery forceps was the substitution of the lock for the pivot, and for the open joints. Foreign writers speak of this as the English joint; and it is often called Smellie's lock, though we don't find him taking any credit for its invention; but I do not know of any earlier forceps than his, possessing this kind of lock. It is true the lock of Pugh's forceps is of the same description, but his work appeared two years later than Smellie's, and in the Memoir of Smellie I show that he had devised it about the year 1744 (*vide* p. 21).

Smellie well knew that the forceps was capable of doing immense injury when used on improper occasions or by unskilful hands, and he therefore lays down very prudent and cautious rules for its employment.

With the same intention he used and recommended short handles to the forceps. From an observation of Smellie's he would appear to have been occasionally in the habit of using a single blade of the forceps, as a vectis or lever, and this failing he advises us to apply the second blade,—a practice I have myself pursued on many occasions.

The controversy about the relative merits of the long and the short forceps has nearly ceased; most practitioners agreeing that a forceps so short as Smellie's (eleven and a half inches) is much inferior in general utility as well as in power, to one a few inches longer. Still it is worthy of note that Smellie frequently delivered with the short forceps, when the head was at the brim, and in cases of deformed pelvis; and he also speaks of locking the forceps "in the middle of the pelvis," where the head is high up. With regard to the value of the pelvic curve there still exists, and probably there always will exist, a difference of opinion among accoucheurs. Perhaps the ablest and warmest advocate for the use of the double-curved forceps in all cases, is Dr. Barnes. In his, and other equally skilful hands I doubt not it is a safe and most efficient instrument, and for his opinion I entertain the greatest respect, but he fails to show on what mechanical principles this presumed superiority rests. Looking to the mechanics of parturition, stronger arguments are on the side of the straight (I do not say short) forceps. Its application is certainly simpler, and it can more safely follow the rotation of the head during its descent through the pelvis. The objections which have been urged against the straight forceps are all, with one immaterial exception, equally applicable to the double-curved forceps; at least they are not more likely to occur in using the former instrument. For instance, I have never seen a fistula resulting from the use of the short forceps; I certainly have seen facial paralysis, but the blades had been improperly applied, and this form of paralysis I have also seen following the use of Barnes' forceps, even in most experienced hands; I never saw or knew of an instance where the sciatic nerve was injured by the straight forceps; I have never seen the perineum torn by this same forceps, except where the blades, having slipped their hold, had become widely separated; but I have seen the perineum torn by the head, when

drawn out too rapidly with the forceps. Smellie with his wonted candour admits to having torn the perineum in case 251, and for this reason that he delivered too suddenly, and besides, the blades were not rightly applied on the head. The only remaining objection to the straight forceps is that the introduction of the upper blade requires considerable depression of the handle; this I allow, but it is a trivial inconvenience, not worthy of serious consideration. Dr. Barnes candidly admits that the straight forceps has one merit "not without importance to the novice, it is easier to use than the long forceps." ('Obstetric Operations,' p. 47.) Dr. Leishman very briefly summarises the advantages of the straight forceps:—"First, the blades are more easily introduced with reference to the position of the child's head, if the operator has but one curve to think of; second, the two blades being the same, no mistake can possibly be made between the upper and lower, or anterior and posterior blade; and third, that if it should be found necessary to alter the position of the head by rotation, this can only be effected by the straight instrument." ('Midwifery,' p. 528.) The special value of the pelvic curve is in cases where the head is very high up, and the brim contracted.]

Sect. 3.—*General rules for using the Forceps.*

The farther the head is advanced in the pelvis, the easier it is delivered with the forceps; because then, if in the 6th or 7th case, it is changed from a round to an oblong figure, by being forced along by the labour-pains; on the contrary, when the head remains high up, resting upon the brim of the pelvis, the forceps are used with greater difficulty and uncertainty.

The os externum must be gradually opened by introducing the fingers one after another in form of a cone, after they have been lubricated with pomatum, moving and turning them in a semicircular motion, as they are pushed up. If the head is so low down that the hand cannot be introduced high up in this form, let the parts be dilated by the fingers turned in the direction of the coccyx, the back of the hand being upwards, next to the child's head: the

external parts being sufficiently opened to admit all the fingers, let the back of the hand be turned to the perinæum, while the fingers and thumb, being flattened, will slide along betwixt the head and the os sacrum. If the right hand be used, let it be turned a little to the left side of the pelvis, because the broad ligament and membrane that fill up the space between the sacrum and ischia, will yield and allow more room for the fingers to advance; for the same reason, when the left hand is introduced, it must be turned a little to the right side. Having gained your point so far, continue to push up, until your fingers pass the os internum; at the same time, with the palm of your hand, raise or scoop up the head, by which means you will be more at liberty to reach higher, dilate the internal parts, and distinguish the situation and size of the head, together with the dimensions of the pelvis; from which investigation you will be able to judge whether the child ought to be turned and brought by the feet, or delivered with the forceps; or, if the labour-pains are strong, and the head presents tolerably fair, without being jammed in the pelvis, you will resolve to wait some time, in hope of seeing the child delivered by the labour-pains, especially when the woman is in no immediate danger, and the chief obstacle is the rigidity of the parts.

The position of the head is distinguished by feeling for one of the ears, the fore or smooth part of which is towards the face of the child; if it cannot be ascertained by this mark, the hands and fingers must be pushed farther up, to feel for the face or back part of the neck; but if the head cannot be traced, the observation must be taken from the fontanel or that part of the cranium where the lambdoidal crosses the end of the sagittal suture. When the ears of the child are towards the sides of the pelvis, or diagonal, the forehead being either to the sacrum or pubes, the patient must lie on her back, with her breech a little

over the bed, her legs and thighs being supported as directed in chap. ii, sect. 1, and chap. iv, sect. 4. If one ear is to the sacrum, and the other to the pubes, she must be laid on one side, with her breech over the bed, as before, her knees being pulled up to her belly, and a pillow placed between them; except when the upper part of the sacrum jets too much forward, in which case she must lie upon her back, as above described.

[Having already (p. 203) made some observations on the position of the patient for delivery, I need say little more here. Cases do occur, as Barnes remarks, in which the dorsal position is preferable to the usual one on the side. Where a patient is very violent and unmanageable, she can be controlled much more effectually on the back.

That our author attached very great importance to a correct apprehension of the position of the head in the pelvis, before proceeding to operate, is very clear from the foregoing and many other passages. And he was perfectly right. If a knowledge of the mechanical principles which regulate parturition be of any value, or should exercise any influence on our manipulations, surely it is necessary to know exactly the position of the head with regard to the pelvis, before we venture to bring artificial force to bear upon it. Of what practical use is all our boasted knowledge of the mechanism of parturition if it is not to guide us in an operation where the two lives are at stake? And how are we to direct our steps in this operation—to utilize our knowledge of the mechanics of labour—if we omit to ascertain the most important data for our guidance? In using the double-curved instrument this knowledge is very desirable, and with the straight forceps it is still more so. By having before his mind the exact position of the fœtal head the operator is enabled to act with decision and confidence where otherwise he would have to proceed with uncertainty and timidity. Upon the point now before us the late Dr. Hugh Hodge thus expresses himself in his posthumous pamphlet—and, be it remembered, he is speaking of the long double-curved forceps—"Hence the importance of learning precisely the exact position, by means of the commissures and fontanelles, of the head in the strait. This is in contravention of the German practice, followed by many English

praetitioners, even by Dr. Barnes in his reeent exeellent work, of applying the blades of the foreeps to the sides of the pelvis, irrespective of the position of the head—a praetiee whieh I must regard as unseientifie and often very detrimental."

Mr. Roberton, of Manehester, another very zealous advocate for the exelusive use of the double-eurved foreeps, lays down that the instrument may have to be applied in four different ways, aceording to the position of the fœtal head in the pelvis, and directs the operator, before eommeneing, to pass his left hand and make "an examination as to the capaeity of the brim, the *position of the head*," &e. &c. ('Essays and Notes,' &e., p. 266). The aet of delivery with the foreeps is from first to last a physieal one, and for its sueeessful performanee there are three postulates in every individual ease, viz. a preeise knowledge of the shape and measurements of the bony eanal; of the shape, dimensions, and position of the head; and of the shape and powers of the instrument employed. Where one or more of these postulates or eonditions be wanting the operator is working at random; and, though he may sueeeed, he has little eause for boasting, inasmuch as he has not wittingly operated "in aeeordanee with seienee based on natural laws."]

The blades of the forceps ought always, if possible, to be introduced along the ears; by which means they approaeh nearer to each other, gain a firmer hold, and hurt the head less than in any other direction; frequently, indeed, not the least mark of their applieation is to be pereeived; whereas, if the blades are applied along the forehead and occiput, they are at a greater distance from eaeh other, require more room, frequently at their points press in the bones of the skull, and endanger a laceration in the os externum of the woman. See Tab. XVI.

[I believe the most satisfaetory hold the forceps ean take of the head, and the one least likely to injure the ehild, is that here described, the blades being as nearly as possible eoincident with the oeeipito-mental diameter, a parietal eminenee and ear being eovered by eaeh blade, whilst the tip of the instrument rests on the eheek. I have often been amazed at the foree I have used with impunity to the ehild when the foreeps was so applied. On the other hand, if the blade rest on the ramus of the jaw, or on the neck, under

the inferior maxilla, or on the superciliary ridge, its pressure is very apt not only to cause a temporary abrasion but to give rise to facial paralysis, sloughing, or diffuse inflammation. Both Burns and Hodge have remarked that, for the successful application of the forceps, it is necessary that flexion of the head must be previously induced either by the natural bearing down efforts or by the accoucheur. (Hodge, op. cit.) Cases occasionally come before us where we cannot make out the exact position of the head, nor feel the ears, and Smellie gives directions further on, to guide us in the application of the instrument under these circumstances. All his directions for the use of the straight forceps are admirable, and not surpassed by those of any later writer that I am acquainted with. He consistently acts up to his knowledge of the mechanical laws of parturition, and is guided in every step of the operation by clear definite principles, doing nothing at random and leaving nothing to chance. In reading his cases we see what pains he took in every instance to make out the precise position of the head, and the condition of the pelvis before setting about the operation. Without such information beforehand, there can be no intelligent, confident use of instruments. This knowledge is to the obstetric operator what the knowledge of anatomy is to the surgical operator.]

The woman being laid in a right position for the application of the forceps, the blades ought to be privately conveyed between the feather bed and the clothes, at a small distance from one another, or on each side of the patient; that this conveyance may be the more easily effected, the legs of the instrument ought to be kept in the operator's side pockets. Thus provided, when he sits down to deliver, let him spread the sheet that hangs over the bed, upon his lap, and, under that cover, take out and dispose the blades on each side of the patient; by which means he will often be able to deliver with the forceps, without their being perceived by the woman herself or any other of the assistants. Some people pin a sheet to each shoulder, and throw the other end over the bed, that they may be the more effectually concealed from the view of those who are present, but this method is apt to confine

and embarrass the operator. At any rate, as women are commonly frightened at the very name of an instrument, it is advisable to conceal them as much as possible, until the character of the operator is fully established.

Sect. 4.—*The different ways of using the Forceps.*

Numb. 1.—*When the Head is down to the Os Externum.*

When the head presents fair, with the forehead to the sacrum, the occiput to the pubes, and the ears to the sides of the pelvis, or a little diagonal; in this case, the head is commonly pretty well advanced in the basin, and the operator seldom miscarries in the use of the forceps. Things being thus situated, let the patient be laid on her back, her head and shoulders being somewhat raised, and the breech advanced a little over the side or foot of the bed, while the assistants, sitting on each side, support her legs, at the same time keeping her knees duly separated and raised up to the belly, and her lower parts always covered with the bed clothes, that she may not be apt to catch cold. In order to avoid this inconvenience, if the bed is at a great distance from the fire, the weather cold, and the woman of a delicate constitution, a chafing-dish with charcoal, or a vessel with warm water, should be placed near or under the bed. These precautions being taken, let the operator place himself upon a low chair, and having lubricated with pomatum the blades of the forceps, and also his right hand and fingers, slide first the hand gently into the vagina, pushing it along in a flattened form, between that and the child's head, until the fingers have passed the os internum; then with his other hand, let him take one of the blades of the forceps from the place where it was deposited, and introduce it betwixt his right hand and the head; if the point or extremity of it should stick at the ear, let it be slipt backward a little, and then guided forwards

with a slow and delicate motion; when it shall have passed the os uteri, let it be advanced still farther up, until the rest at which the blades look into each other be close to the lower part of the head, or at least within an inch thereof.

Having in this manner introduced one blade, let him withdraw his right hand, and insinuate his left in the same direction, along the other side of the head, until his fingers shall have passed the os internum; then taking out the other blade from the place of concealment, with the hand that is disengaged, let it be applied to the other side of the child's head by the same means employed in introducing the first; then the left hand must be withdrawn, and the head being embraced between the blades, let them be locked in each other. Having thus secured them, he must take a firm hold with both hands, and when the pain comes on, begin to pull the head along from side to side; continuing this operation during every pain until the vertex appears through the os externum, and the neck of the child can be felt with the finger below the os pubis; at which time the forehead pushes out the perineum like a large tumour; then let him stand up, and raising the handles of the forceps, pull the head upwards also, that the forehead being turned half round upwards, the perineum and lower parts of the os externum may not be tore.

[Smellie here, and in other places, directs the operator to "pull the head along from side to side," or "from one ear of the child to another." This oscillatory or swinging motion has been recommended by most writers on the use of the forceps since the days of Smellie; but a few have expressed disapproval of it, and advise that the operator should only exercise simple traction in the proper direction. Quite lately, Dr. Matthews Duncan has published his opinion on this point ('Ed. Med. Jour.,' Feb., 1876). He is strongly opposed to this leverage or pendulum-like movement of the forceps, considering it to be "useless and injurious." Dr. Barnes, who is justly regarded as one of highest authorities on operative midwifery, makes the following observation:—"I believe

that pure traction is almost impossible, and I am equally certain that a gentle and careful leverage will enable you to deliver with a great economy of force and time, which means, of course, greater safety to the mother" ('Obstetric Operations,' p. 39). My own experience and reflection, lead me to believe that the movement in question, when executed with moderation and gentleness, is calculated to favour the advance of the head.

Dr. Duncan puts the case this way:—"A mechanical difficulty in bringing a child's head through a resisting passage has to be overcome; further, the difficulty is not to be evaded by changing the position of the child's head; on the contrary, that position may be supposed to be the most favourable for facility of propulsion. How can any oscillation or other imaginable movement diminish the mutual, and in this case, injurious pressure or force required to produce advance? The question requires no answer. The supposition is absurd." On this passage I would just remark (1), that a change in the position of the head does often materially diminish the resistance to its advance. (2). That the natural *propelling* force acting through the spine, leaves the head free to adapt itself to the pelvis; but (3), that the *vis a fronte*, with the forceps, does not leave to the head that freedom of adaptation, and hence the utility of the hand-to-hand movement.

If the fœtal head were perfectly spherical, and the pelvic canal perfectly cylindrical, simple traction is all that could be required to extract the former. But knowing, as we do, that the reverse of these conditions is the fact, it seems reasonable to suppose that a little side-to-side movement, must assist the head in accommodating itself to the varying shape and capacity of the tube it is traversing.]

In stretching the os externum or internum we ought to imitate nature; for, in practice, we find, that when they are opened slowly, and at intervals, by the membranes with the waters, or the child's head, the parts are seldom inflamed or lacerated; but in all natural labours, when these parts are suddenly opened, and the child delivered by strong and violent pains, without much intermission, this misfortune sometimes happens, and the woman is afterwards in great pain and danger.

[From this and the sueeeeding paragraphs, it has been supposed that Smellie sanetioned the use of the foreeps in eases where the os uteri was only partially dilated. Sueh an inferenee, however, is not eorreet, and reeeives no support from his teaehing elsewhere or from his praetiee; and nearly every writer of eharaeter upon the foreeps, from Smellie's time to the present, has insisted upon the os being fully dilated, as a eondition for the safe employment of the instrument. It is, therefore, satisfaetory to know that the experienee of Dr. George Johnston, at the Dublin Lying-in Hospital, has demonstrated that the foreeps may, with safety, to the mother and ehild, be applied by expert hands, when the os is only one half or two fifths dilated ('Dub. Med. Jour.,' Mareh, 1876). But its employment under these eireumstanees is quite exeeptional, and ean only be regarded as a resouree of whieh a skilful operator may avail himself in eases of extreme urgeney.

Before dismissing the subjeet of the foreeps, I would wish to say a word on the relative frequeney of its employment. Smellie's great suecess in the use of the instrument, and the clear definite rules he laid down for its applieation, had, no doubt, a very great influenee in raising it in the estimation of the profession and of the publie, whieh soon led to its over-frequent and injudieious employment, as well by eompetent as ineompetent operators, and oftentimes produced deplorable eonsequenees. Henee a reaetion against the instrument was started by Hunter, Osborne, and Denman, the effeet of whieh had not passed away until the last quarter of a eentury. There is again some danger of a return to the over-frequent employment of the instrument, for I think that to use it onee in every ten labours, or *oftener,* is a serious departure from safe and judieious praetiee, unless we are prepared to believe that the whole business of parturition should, as mueh as possible, be taken out of the hands of nature and be effeeted by those of the aeeoueheur—a doetrine I am not prepared to subseribe to. With a higher degree of eivilization and more artifieial modes of life sueh praetiee may, at some future time, become justifiable. No man ever used the foreeps with more judieious, rational boldness than did Smellie; and yet what was his praetiee with regard to his own patients? Let him speak for himself. "In my private praetiee, I have very seldom oeeasion for the assistanee of that (foreeps) or any other instrument." (Preface to vol. ii.)

Churchill all his life was a strong and eonsistent advoeate for the

use of the forceps, yet in his own private practice, extending over thirty-nine years, and embracing 2547 labours, the proportionate frequency of its employment was only once in 60½ cases! ('Dub. Med. Jour.,' June, 1872.) In my own private practice I find I have used the forceps or vectis once in thirty-six cases. I freely admit that in hospital practice the number of cases requiring instrumental assistance of every kind must always be far greater than among the private patients of the accoucheur. What, I should like to know, are we to consider as the highest rate of frequency of the forceps, coincident with the lowest rate of mortality to mother and child? As long as the mortality diminishes *pari passu* with the more and more frequent use of the forceps, we are justified in going on. But surely there must be some limit to this—some line beyond which the mortality will gradually begin to rise in a certain ratio with the increasing frequency of the operation.

This limit has not yet been determined, though an approach to it can be made by comparing the results of the practice of five of the Masters of the Dublin Lying-in Hospital. This Dr. Kidd has done ('Dub. Med. Jour.,' January, 1872); and he has given a very elaborate and instructive table, which exhibits the proportionate frequency with which the forceps was used, as well as the mortality among mothers and children, in tedious and instrumental labours occurring in the Dublin Lying-in Hospital, during the Masterships of Joseph Clarke, Collins, Charles Johnson, Shekleton, and George Johnston.[1] This table demonstrates that the increasing employment of the forceps was followed by a diminishing mortality up to the Mastership of Dr. Shekleton, when the forceps was resorted to 32·69 times per cent. in tedious and difficult labours, and when the mortality among cases of this class reached its minimum, viz. 6·03 per cent. in place of 20·21 per cent. under Clarke, who only used the forceps 1·79 times in the hundred of same cases. Dr. George Johnston had recourse to the forceps still more frequently, employing them 75·68 times per cent. (in tedious and difficult labours); but his mortality in the same description of cases was 1·35 per cent. greater than that of Dr. Shekleton; it is fair to add, however, that Dr. Johnson's infantile mortality was only 9·59 per cent. against 32·68 per cent. under Dr. Shekleton's practice, and 53·005 per cent. under

[1] It is right to state that only three years' clinical records of Dr. Johnson's mastership were reported (by Hardy and M'Clintock); and only four years of Dr. Johnston's mastership had elapsed when Dr. Kidd drew up his paper.

Clarke, in the same class of cases, viz. those of the tedious and difficult labour. Hence it would appear that the late master of the hospital, Dr. George Johnson, effected a larger saving of infantile life, among the cases of which we have been speaking, than any of his predecessors in that institution, of whose practice we possess records.

I can well understand that, provided this powerful agent be employed by skilful hands, under the direction of experienced heads, it may be employed at the rate of *one* in *ten*, with perfect safety to mother and child, and with a great saving of pain to the former, and of time to the operator. But I maintain that more than two thirds of the patients so delivered would have fared just as well, had no instrumental assistance whatever been given. In simply tedious labours the exact time at which the forceps may be advantageously interposed must depend a good deal on the operator; the risk from the instrument being so much less with a good than a bad operator. The former need not wait so long for a natural termination as the unskilful should do. Moreover, we should never forget that the *practicability* of using or applying the instrument is totally different and distinct from the *advisability* of doing so.]

We ought therefore, when obliged to dilate those parts, to proceed in that slow, deliberate manner; and though, upon the first trial, they feel so rigid, that one would imagine they could never yield or extend; yet, by stretching with the hand and resting at intervals, we can frequently overcome the greatest resistance. We must also, in such cases, be very cautious, pulling slowly, with intermissions, in order to prevent the same lacerating; for which purpose, too, we ought to lubricate the perineum with pomatum during those short intervals, and keep the palm of one hand close pressed to it and the neighbouring parts, while with the other we pull at the extremity of the handles of the forceps; by which means we preserve the parts, and know how much we may venture to pull at a time. When the head is almost delivered, the parts thus stretched must be slipped over the forehead and face of the child, while the operator pulls upwards with the other hand, turning the handles of the forceps to the

abdomen of the woman. This method of pulling upwards raises the child's head from the perineum, and the half-round turn to the abdomen of the mother brings out the forehead and face from below; for when that part of the hind-head which is joined to the neck rests at the under part of the os pubis, the head turns upon it as upon an axis. In preternatural cases also, the body being delivered must in the same manner be raised up over the belly of the mother, and at the same time the perineum slipt over the face and forehead of the child.

In the introduction of the forceps, let each blade be pushed up in an imaginary line from the os externum to the middle space betwixt the navel and scrobiculus cordis of the woman; or, in other words, the handles of the forceps are to be held as far back as the perineum will allow. The introduction of the other hand to the opposite side, will, by pressing the child's head against the first blade, detain it in its proper place till the other can be applied; or, if this pressure should not seem sufficient, it may be supported by the operator's knee.

When the head is come low down, and cannot be brought farther, because one of the shoulders rests above the os pubis, and the other upon the upper part of the sacrum, let the head be strongly grasped with the forceps, and pushed up as far as possible, moving from blade to blade as you push up, that the shoulders may be the more easily moved to the sides of the pelvis, by turning the face or forehead a little towards one of them; then the forehead must be brought back again into the hollow of the sacrum, and another effort made to deliver; but, should the difficulty remain, let the head be pushed up again, and turned to the other side; because it is uncertain which of the shoulders rests on the os pubis or sacrum. Suppose, for example, the right shoulder of the child sticks above the os pubis, the forehead being in the hollow of the sacrum: in this case, if the

forehead be turned to the right-hand side of the woman, the shoulder will not move; whereas, if it be turned to the left, and the head at the same time pushed a little upwards, so as to raise and disengage the parts that were fixed, the right shoulder being towards the right-hand side and the other to the left side of the brim of the pelvis, when the forehead is turned back again to the hollow of the sacrum, the obstacle will be removed, and the head be more easily delivered. This being performed, let the forceps be unlocked, and the blades disposed cautiously under the cloaths so as not to be discovered; then proceed to the delivery of the child, which, when the navel-string is cut and tied, may be committed to the nurse. The next care is to wipe the blades of the forceps singly, under the clothes, slide them warily into your pockets, and deliver the placenta.

Though the forceps are covered with leather, and appear so simple and innocent, I have given directions for concealing them, that young practitioners, before their characters are fully established, may avoid the calumnies and misrepresentations of those people who are apt to prejudice the ignorant and weak-minded against the use of any instrument, though ever so necessary, in this profession; and who, taking the advantage of unforeseen accidents which may afterwards happen to the patient, charge the whole misfortune to the innocent operator. See Collect. XXVII, and Tab. XIV, XVII, XVIII, XIX.

[Here and in other places Smellie speaks of the shoulders of the fœtus hitching on the pubes, and he gives particular directions how this cause of delay is to be overcome. Writers on midwifery generally say nothing on this point, as the difficulty is one which persistent traction cannot fail to overcome; still Smellie's advice is sound and rational, and shows the minute care with which he investigated every circumstance in the delivery, and sought to trace each difficulty that might arise to its proper source. I never experienced any considerable resistance which I could be sure arose from this cause; yet I do not at all mean to question the correctness of the statement

in the text, though it is possible he may have been influenced by the notion that the shoulders enter in the transverse diameter of the brim. Be this as it may, however, the directions he gives are in strict accordance with the mechanical adaptation of the shoulders to the pelvic diameters.]

Numb. 2.—*When the Forehead is to the Os Pubis.*

When the forehead, instead of being towards the sacrum, is turned forwards to the os pubis, the woman must be laid in the same position as in the former case; because here also the ears of the child are towards the sides of the pelvis, or a little diagonally situated, provided the forehead is towards one of the groins. The blades of the forceps being introduced along the ears, or as near them as possible, according to the foregoing directions, the head must be pushed up a little, and the forehead turned to one side of the pelvis; thus let it be brought along until the hindhead arrives at the lower part of the ischium, then the forehead must be turned backward, into the hollow of the sacrum, and even a quarter or more to the contrary side, in order to prevent the shoulders from hitching on the upper part of the os pubis or sacrum, so that they may be still towards the sides of the pelvis; then let the quarter turn be reversed, and the forehead being replaced in the hollow of the sacrum, the head may be extracted as above. In performing these different turns, let the head be pushed up or pulled down occasionally, as it meets with least resistance. In this case, when the head is small, it will come along as it presents; but if large, the chin will be so much pressed against the breast, that it cannot be brought up with the half-round turn, and the woman will be tore if it comes along. See Collect. XXVIII, and Tab. XX, XXI.

[Smellie's practice in occipito-posterior positions may be considered somewhat bold and meddlesome; still it was based on correct mechanical principles. In case 258, he tells us with great

simplicity, how he first hit on the plan of rectifying this malposition of the head, and what joy the discovery afforded to him. I have already (at p. 217) touched on this subject, so need say little more here. Cases 257, 258, 259, 260, and 270, will be found illustrating the remarks in the text. His direction to push up the head before attempting its rotation, is noteworthy, and shows how minutely he had studied the mechanism of these cases.

No specific directions are here given how to conduct the delivery if rotation of the head be impracticable, but from cases 257, 259, and 270, we can learn something of his practice under these circumstances. That Smellie clearly understood the mechanical principles which should guide us in attempting rectification, is undeniable. Where this was impracticable he sometimes followed a plan that in recent years has been laid down by Dr. Bedford (in his 'Principles and Practice of Obstetrics'), and which has been criticised by Dr. Kidd and Dr. Leishman. Dr. Bedford's words are: "It must also be recollected that in this position the forceps, as soon as the head begins slightly to protrude, instead of being elevated, must be depressed, for the purpose of bringing the chin from the sternum, so that when the head is delivered the instrument will be at a right angle with the spinal column." It appears to me that Smellie pursued the very same course here described; in case 259 he remarks, "instead of pulling upwards as before, to raise the head from below the os pubis, I pulled downwards to bring the forehead and face out from below that bone: they accordingly slipped out gradually, and when the chin was delivered from below the pubes, I turned up the handles of the forceps towards the face, pulled the head upwards, and delivered it according to the directions laid down in those cases where the face presents." By thus drawing down the face below the pubic arch, the case was changed into a favourable variety of face presentation, with chin anteriorly. Leishman alludes to a "possible termination of occipito-posterior positions," by a movement of extension, or rotation of the head on its transverse axis, by which the case is changed into a presentation of the face; and he thinks such would be rather a favourable termination than otherwise to the cases which Dr. Uvedale West terms *fronto-colyloid* (op. cit., p. 342).

It seems highly probable, therefore, that a mode of delivery similar to that described by Smellie in the above case, might sometimes be adopted with advantage in these cases of face to pubes.]

NUMB. 3.—*When it presents fair at the Brim of the Pelvis.*

When the forehead and face of the child are turned to the side of the pelvis, (in which case it is higher than in the first situation), it will be difficult, if the woman lies on her back, to introduce the forceps so as to grasp the head with a blade over each ear; because the head is often pressed so hard against the bones, in this position, that there is no room to insinuate the fingers between the ear and the os pubis, so as to introduce the blades safely on the inside of the os internum, or push one of them up between the fingers and the child's head. When things are so situated, the best posture for the woman is that of lying on one side, as formerly directed, because the bones will yield a little, and the forceps (of consequence) may be the more easily introduced.

[At page 80, the author expressed his belief that in some women, when the head is forced into the pelvis by strong pains, "the junctures of the sacrum with the ossa ilium, as well as that of the ossa pubis seem to yield a very little," &c., and assuming such to be the fact, he would appear to infer that the lateral position of the patient tended to give a little more space in the conjugate diameter, by allowing the ossa innominata to be moved forwards, which they could not so well do were she lying on her back.]

Suppose her lying on her left side, and the forehead of the child turned to the same side of the pelvis, let the finger of the operator's right hand be introduced along the ear, between the head and the os pubis, until they pass the os internum, if the head is so immoveably fixed in the pelvis, that there is no passage between them, let his left hand be pushed up between the sacrum and the child's head, which being raised as high as possible above the brim of the pelvis, he will have room sufficient for his fingers and forceps; then let him slide up one of the blades

with the right hand, remembering to press the handle backwards to the perineum, that the point may humour the turn of the sacrum and child's head: this being effected, let him withdraw his left hand, with which he may hold the handle of the blade already introduced while he insinuates the fingers of his right hand at the os pubis, as before directed, and pushes up the other blade slowly and gently, that he may run no risk of hurting the os internum or bladder; and here also keep the handle of it as far backwards as the perineum will allow: when the point has passed the os internum, let him slide it up farther, and join the legs by locking them together, keeping them still in a line with the middle space betwixt the navel and scrobiculus cordis. Then let him pull along the head, moving it from side to side, or from one ear of the child to another. When it is sufficiently advanced, let him move the forehead into the hollow of the sacrum, and a quarter turn farther, then bring it back into the same cavity; but if the head will not easily come along, let the woman be turned on her back, after the forceps have been fixed, and the handles firmly tied with a garter or fillet; let the hind-head be pulled half-round outwards from below the os pubis, and the instrument and child managed as before.

In all those cases that require the forceps, if the head cannot be raised above the brim of the pelvis, or the fingers introduced within the os internum to guide the points of the forceps along the ears, especially at the ossa pubis, ischia, or sacrum, let the fingers and hand be pushed up as far as they will go along the open space betwixt the sacrum and ischium; then one of the blades may be introduced, moved to and fixed over the ear, the situation of which is already known: the other hand may be introduced, and the other blade conducted in the same manner on the opposite side of the pelvis; but before they are locked together, care must be taken that they be exactly opposite to each

other, and both sufficiently introduced. In this case, if the operator finds the upper part of the saerum jetting in so mueh that the point of the foreeps eannot pass it, let him try with his hand to turn the forehead a little baekwards, so that one ear will be towards the groin, and the other towards the side of that prominence; consequently there will be more room for the blades to pass along the ears: but if the forehead should remain immoveable, or, though moved, return to its former plaee, let one blade be introdueed behind one ear, and its fellow before the other; in which ease the introduetion is sometimes more easily performed when the woman lies on her back, than when she is laid on one side. See Collect. XXIX, and Tab. XIII, XVI.

[The oblique application of the blades here described was only a very exceptional proceeding, and one which Smellie adopted from necessity and not from choice. Still he did it deliberately and knowingly. Cases 266, 268, and 269, are examples of this oblique application of the forceps. At the present day, however, this mode of seizing the head has become the established rule in the use of the double-curved forceps.]

Numb. 4.—*When the Face presents.*

When the face presents resting on the upper part of the pelvis, the head ought to be pushed up to the fundus uteri, the child turned and brought by the feet, aeeording to the directions that will be given when we eome to treat of preternatural deliveries; because the hind-head is turned baek on the shoulders, and, unless very small, cannot be pulled along with the forceps; but should it advance pretty fast in the pelvis, it will be sometimes delivered alive without any assistance. But if it descends slowly, or, after it is low down, sticks for a eonsiderable time, the long pressure on the brain frequently destroys the child, if not

relieved in time by turning or extracting with the forceps.

[With regard to the treatment of face presentations, it has become a well-established maxim that interference is not of necessity called for on account of the presentation. Churchill has directed special attention to the important fact that in the statistics of these cases, "the mortality among both mothers and children is greatest when assistance was given; for of Dr. Collins' thirty-three, M. Boer's eighty, and Dr. Arneth's forty cases delivered naturally, none of the mothers, and but twelve of the children were lost." ('Midwifery,' 5th edit., p. 444.) I may further mention that of thirty-five cases occurring in the Dublin Lying-in Hospital during the mastership of Dr. C. Johnson (whose assistant I was), thirty-one were delivered by the natural efforts, and all these women recovered. Of the remaining four patients, two were delivered by craniotomy, one of whom died; a third by turning on account of rupture of the uterus, who also died; and the fourth was delivered by the vectis and recovered.

Reasoning *à priori*, we should be led to suppose that owing to the faulty position of head—with its longest diameter opposed to the pelvis—the need of artificial assistance must be very frequent. But statistics do not at all bear out this conclusion; quite the contrary; and I have long held the opinion, derived from clinical experience, that pelvic capaciousness is really a predisposing cause of face presentation. That Smellie greatly over-estimated the danger of these cases is certain, and yet his experience had taught him that delivery would sometimes take place without instrumental assistance (of which Cases 134, 135, 136, 140, 141, are examples), and in his observations upon Case 390 (written many years after its occurrence) he frankly says, "The fault was in not waiting longer; for I have had many cases since, where waiting patiently, the head has advanced and been delivered with the pains or with the forceps."

Among the older authors Portal (1685) was the only one, perhaps, who took a really correct view of face presentation, for he says, "We may look upon it as not receding much from a natural birth," and to take it "for a general rule, that if we find the face foremost, to have patience, and not to be too busy with our fingers, unless it be to anoint the passage with fresh butter, to render it the more

slippery, and consequently the more easy for the child." Deleurye, in 1770, and after him Boer, in 1793, seem to have been among the first, however, who strongly objected to any special assistance being required in this class of cases.]

When the head is detained very high up, and no signs of its descending appear, and the operator, having stretched the parts with a view to turn, discovers that the pelvis is narrow and the head large, he must not proceed with turning, because, after this hath been performed, perhaps with great difficulty, the head cannot be delivered without the assistance of the crotchet. No doubt it would be a great advantage in all cases where the face or forehead presents, if we could raise the head so as to alter the bad position, and move it so with our hand as to bring the crown of the head to present; and indeed this should always be tried, and more especially when the pelvis is too narrow or the head too large, and when we are dubious of saving the child by turning; but frequently this is impossible to be done when the waters are evacuated, the uterus strongly contracted on the child, and the upper part of the head so slippery as to elude our hold; insomuch, that even when the pressure is not great, we seldom succeed unless the head is small, and then we can save the child by turning. If you succeed, and the woman is strong, go on as in natural labour; but if this fails, then it will be more advisable to wait with patience for the descent of the head, so as that it may be delivered with the forceps, and consequently the child may be saved; but if it still remains in its high situation, and the woman is weak and exhausted, the forceps may be tried; and should they fail, recourse must be had to the crotchet, because the mother's life is always to be more regarded than the safety of the child.

[Attempts to rectify the position by rotating the head on its transverse axis, and thus restoring flexion, have seldom succeeded, unless tried when the head is high up, and before, or soon after, the

escape of the waters (as in Cases 137 and 138), and even then the manipulation is difficult of accomplishment, as our author himself admits. If the face be arrested at the brim, turning or the forceps may be resorted to. Barnes seems to prefer the former. Our author records seven cases where turning was practised under these circumstances; their numbers are 324, 345, 367, 368, 377, 388, and 389.]

When the face of the child is come down, and sticks at the os externum, the greatest part of the head is then squeezed down into the pelvis, and, if not speedily delivered, the child is frequently lost by the violent compression of the brain; besides, when it is so low down, it seldom can be returned on account of the great contraction of the uterus. In this case, when the chin is turned towards the os pubis, at the lower part of that bone, the woman must be laid on her back, the forceps introduced as formerly directed in the first case, and when the chin is brought out from under the os pubis the head must be pulled half-round upwards; by which means the fore and hind head will be raised from the perineum, and the under part of the os externum prevented from being tore.

If the chin points to either side of the pelvis, the woman must be laid on her side; the blades of the forceps introduced along the ears, one at the os pubis and the other at the sacrum; and the chin, when brought lower down, turned to the pubis, and delivered; for the pelvis being only two inches in depth at this place, the chin is easily brought from under it, and then the head is at liberty to be turned half-round upwards; because the chin, being disengaged from this bone, can be pulled up over it externally; by which means two inches of room at least will be gained for the more easy delivery of the fore and hind head, which are now pressed against the perineum. When the chin is towards the sacrum, and the hind head pressed back betwixt the shoulders, so that the face is kept from rising up below the os pubis, the head must be pushed up with the

hand to the upper part of the pelvis, and the forceps introduced and fixed on the ears; the hind head must be turned to one side of the pelvis, while the chin is moved to the other side, and, if possible, to the lower part of the ischium: then the hind head must be brought into the hollow of the sacrum, with the chin below the os pubis, and delivered as above directed. If this cannot be done, let the operator try with the forceps to pull down the hind-head below the os pubis, and at the same time with the fingers of the other hand push the face and forehead backwards and upwards into the hollow of the sacrum.

For when the chin points to the back part of the pelvis, the forehead is squeezed against the os pubis, while the hind-head is pressed upon the back betwixt the shoulders; so that the head cannot be delivered unless the occiput can be brought out from below the os pubis, as formerly described. See Tab. XXIII, XXV, XXVI.

[Although we are bound to suppose it is the straight forceps which is here spoken of in the text, and its application described; yet, in the explanation to plate xxvi, where the face is represented as being low in the pelvis with the chin posteriorly, he observes "the best method in this case after the short or long *curved* forceps have been applied along the ears," &c. This we may suppose to have been his later and more matured experience, as his set of anatomical and obstetrical plates did not appear for a couple of years after the first volume of his treatise.

I have never seen a case where the chin was not anterior by the time the face had descended to the lower part of the pelvis; but Smellie gives two such cases, Nos. 136 and 274, in each of which the child was so delivered. If the chin unfortunately be directed towards the sacrum at this advanced stage of the labour, the difficulty opposed to delivery is very great, unless the child be small, or the pelvis very roomy. If the fœtus be living, Smellie's operation (as in case 273) might be tried. If the fœtus be dead, perforation and cephalotripsy should at once be employed.]

Numb. 5.—*Recapitulation.*

The sum of all that has been said on this head, may be comprehended in the following general maxims.

[For sake of convenience I have numbered these aphorisms.]

I. Young practitioners are often at a loss to know and judge by the touch in the vagina, when the head is far enough down in the basin for using the forceps. If we were to take our observations from what we feel of the head at the os pubis, we should be frequently deceived, because in that place the pelvis is only two inches in depth, and the head will seem lower down than it really is; but if, in examining backwards, we find little or no part of it towards the sacrum, we may be certain that all the head is above the brim; if we find it down as far as the middle of the sacrum, one third of it is advanced; if as far down as the lower part, one half: and in this case, the largest part is equal with the brim. When it is in this situation, we may be almost certain of succeeding with the forceps; and when the head is so low as to protrude the external parts, they never fail. But these things will differ according to different circumstances, and may occasion a tedious delivery.

II. Let the operator acquire an accurate knowledge of the figure, shape, and dimensions of the pelvis, together with the shape, size, and position of the child's head.

III. Let the breech of the woman be always brought forwards a little over the bed, and her thighs pulled up to her belly, whether she lies on her side or back, to give room to apply and to move the forceps upor down or from side to side.

IV. Let the parts be opened and the fingers pass the os internum; in order to which, if it cannot be otherwise accomplished, let the head be raised two or three inches, that the fingers may have more room; if the head can be raised above the brim, your hand is not confined by the

bones ; for, as we have already observed, the pelvis is wider from side to side at the brim than at the lower part ; if the fingers are not past the os uteri, it is in danger of being included betwixt the forceps and the child's head.

V. The forceps, if possible, should pass along the ears, because in that case they seldom or never hurt or mark the head.

VI. They ought to be pushed up in an imaginary line, towards the middle space between the navel and scrobiculus cordis, otherwise the ends will run against the sacrum.

VII. The forehead ought always to be turned into the hollow of the sacrum, when it is not already in that situation.

VIII. When the face presents, the chin must be turned to below the os pubis, and the hind-head into the hollow of the sacrum.

IX. When the shoulders rest at the pubes, where they are detained, the head must be turned a large quarter to the opposite side, so as that they may lie towards the sides of the pelvis.

X. The head must be always brought out with an half-round turn, over the outside of the os pubis, for the preservation of the perineum, which must at the same time be supported with the flat of the other hand, and slided gently backwards over the head.

XI. When the head is so low as to protrude the parts in form of a large tumour, and the vertex hath begun to dilate the os externum, but instead of advancing, is long detained in that situation, from any of the forementioned causes of laborious cases, and the operator cannot exactly distinguish the position of the head, let him introduce a finger between the os pubis and the head, and he will frequently find the back part of the neck, or one ear, at the fore-part or towards the side of the pelvis. When the situation is known he needs not stretch the os externum, and raise the head, as formerly directed ; but he may introduce the forceps,

and, they being properly joined and their handles tied, pull gently during every pain, or, if the pains are gone, at the interval of four or five minutes, that the parts may be slowly dilated, as they are in the natural labour; but when the situation cannot be known, the head ought to be raised. The same method may also be taken when the face presents, and is low in the pelvis, except when the chin is toward the back part; in this case the head ought to be raised likewise.

XII. Almost all these directions are to be followed, except when the head is small, in which case it may be brought along by the force of pulling; but this only happens when the woman is reduced, and the labour-pains are not sufficient to deliver the child; for the lower part of the uterus may be so strongly contracted before the shoulders, and so close to the neck of the child, as to prevent its advancing, even when the head is so loose in the pelvis that we can sometimes push our fingers all round it; and this is oftenest the occasion of preventing the head's being delivered when low in the pelvis. The difficulty, when high up, is from the restraint at the brim; and when it passes that, the head is seldom retained in the lower part, unless the patient is weak. In this case we need not wait, because we are commonly certain of relieving the woman immediately with the forceps, by which you prevent the danger that may happen, both to the mother and child, by the head's continuing to lodge there too long. This case should be a caution against breaking the membranes too soon, because the uterus may contract too forcibly and too long before the shoulders. When the head in this case is advanced one third or half way on the outside of the os externum, if the pains are strong, this last inconvenience is frequently remedied by introducing your two fingers into the rectum, as formerly directed. By these rules, delivery may (for the most part) be performed with ease and safety. Neverthe-

less the head is sometimes so squeezed and locked in the pelvis, and the hairy scalp so much swelled, that it is impracticable to raise up the head so as to come at the ears or os internum, or to distinguish the sutures of the skull so as to know how the head presents. In this case the forceps must be introduced at random, and the uncertainty of the position is generally removed by remembering, that in those cases where the head is squeezed down with great difficulty, the ears are for the most part towards the os pubis and sacrum; and that the forehead seldom turns into the hollow of the sacrum, before the occiput is come down to the lower part of the ischium; and then rises gradually towards the under part of the os pubis, and the perineum and anus are forced down before it in form of a large tumour.

On such occasions, the woman being laid on her side, if one ear is to the sacrum and the other to the os pubis, the blades of the forceps are to be introduced; and if they meet with any resistance at the points, they must not be forcibly thrust up, lest they pass on the outside of the os uteri and tear the vagina, which together with the womb would be included in the instrument and pulled along with the head; for this reason, if the blade does not easily pass, let it be withdrawn a little downwards, as before directed, and pushed up again, moving the point close to the head; if the ear obstructs its passage, let the point be brought a little outwards; and by these cautious essays it will at length pass without further resistance, and ought to be advanced a considerable way in order so certify the operator that he is not on the outside of the os internum.

When the forceps are fixed, and the operator, uncertain which way the forehead lies, let him pull slowly, and move the head with a quarter turn, first to one side and then to the other, until he shall have found the direction in which it comes most easily along.

If at any time we find the forceps begin to slip, we must rest and push them up again gently; but if they are like to slide off at a side, untie the handles, and move them so as to take a firmer hold, fix as before, and deliver. If we are obliged to hold with both hands, the parts may be supported by the firm application of an assistant's hand; for without such cautious management they will run a great risk of being lacerated, a misfortune which rarely happens when the perineum is properly pressed back, and the head leisurely delivered. Sometimes, when the head is brought low down, you may take off the forceps, and help along with your fingers on each side of the coccyx or in the rectum, as directed in the natural labour.

If the head is low down, the ears are commonly diagonal, or to the sides; and when the head is brought down one third or one half through the os externum, the operator can then certify himself whether the forehead is turned to the coccyx or os pubis, by feeling with his finger for the back part of the neck or ear, betwixt the os pubis and the head; and then move the head as above directed.

Let him try to alter with his hand every bad position of the head; and if it be detained high up in the pelvis, in consequence of the woman's weakness, the rigidity of the parts, the circumvolutions or shortness of the funis, or the contraction of the uterus over the shoulders of the child, the forceps will frequently succeed when the fœtus cannot be turned; but if the head is large or the pelvis narrow, the child is seldom saved either by turning or using the forceps, until the head shall be farther advanced. And here it will not be amiss to observe, that the blades of the forceps ought to be new-covered with stripes of washed leather after they shall have been used, especially in delivering a woman suspected of having an infectious distemper. See Collect. XXX.

Sect. 5.—*When and how to use the Crotchet.*

Numb. 1.—*The Signs of a Dead Child.*

When the head presents, and cannot be delivered by the labour-pains; when all the common methods have been used without success, the woman being exhausted, and all her efforts vain; and when the child cannot be delivered without such force as will endanger the life of the mother, because the head is too large or the pelvis too narrow, it then becomes absolutely necessary to open the head and extract with the hand, forceps, or crotchet. Indeed, this last method formerly was the common practice when the child could not be easily turned, and is still in use with those who do not know how to save the child by delivering with the forceps: for this reason their chief care and study was to distinguish whether the fœtus was dead or alive; and as the signs were uncertain, the operation was often delayed until the woman was in the most imminent danger; or, when it was performed sooner, the operator was frequently accused of rashness, on the supposition that the child might in time have been delivered alive by the labour-pains. Perhaps he was sometimes conscious to himself of the justice of this imputation, although what he had done was with an upright intention.

The signs of a dead fœtus were, first, The child's ceasing to move and stir in the uterus. Secondly, The evacuation of meconium, though the breech is not pressed into the pelvis. Thirdly, no perceivable pulsation at the fontanel and temporal arteries. Fourthly, a large swelling or tumour of the hairy scalp. Fifthly, an uncommon laxity of the bones of the cranium. Sixthly, the discharge of a fœtid ichor from the vagina, the effluvia of which surrounding the woman, gave rise to the opinion that her breath conveyed

a mortified smell. Seventhly, want of motion in the tongue when the face presents. Eighthly, no perceivable pulsation in the arteries of the funis umbilicalis, when it falls down below the head; nor at the wrist, when the arm presents; and no motion of the fingers. Ninthly, the pale and livid countenance of the woman. Tenthly, a collapsing and flaccidity of the breasts. Eleventhly, a coldness is felt in the abdomen, and weight, from the child's falling, like a heavy ball, to the side on which she lies. Twelfthly, a separation of the hairy scalp on the slighest touch, and a distinct perception of the bare bones.

All or most of these signs are dubious and uncertain, except the last, which can only be observed after the fœtus hath been dead several days. One may also certainly pronounce the child's death, if no pulsation hath been felt in the navel-string for the space of twenty or thirty minutes; but the same certainty is not to be acquired from the arm, unless the skin can be stripped off with ease.

[The life or death of the fœtus is a circumstance which often has a direct and most important bearing on our practice in cases of labour. And this must always be so; for although the advance of obstetric knowledge has greatly diminished the number of cases in which instruments of a destructive kind are *absolutely* required, still such cases shall continue to present themselves; and, furthermore, where the child is known to be dead, we are then free to select that mode of delivery which is the least calculated to inflict injury or pain on the mother. Our author gives a list of twelve signs of a dead fœtus; taking them in their numerical order, I shall make a remark upon each.

1. The fœtal movements generally subside or become imperceptible on the accession of labour, and sometimes for a few days previously. Their not being felt by the patient during labour is wholly worthless as an indication of the death of the child.

2. Meconium coming away in head or transverse presentation is a suspicious circumstance, and one far more apt to occur with a dead than with a living fœtus. It is supposed that the escape of meconium in these cases is due to relaxation of the sphincter ani,

induced by a comatose condition of the fœtus; and if so, the first appearance of this discharge would only indicate the presence of serious danger to the child—not its actual death. This sign is of little or no value when the breech presents and has engaged in the true pelvis, for the mechanical compression of the belly would cause the meconium to be squeezed out.

3. It is so extremely difficult to feel the pulsation of the fontanelle or the pulse where the child is living, that the absence of one or both of these signs is of little value as indicating the death of the fœtus.

4. Tumour or swelling of the scalp is rather a proof that the child is or recently has been alive. I am, therefore, surprised how Smellie should have included this among the signs of fœtal death. On the other hand, the absence of any scalp tumour where the head has been for some hours engaged in the pelvis is a very strong presumptive, though negative, proof that the infant is devoid of vitality.

5. To an educated finger this mobility of the cranial bones, with flaccidity of the integument, is a very strong proof of the fœtus being dead. It must be remembered, however, that in a premature child there is a good deal more of this laxity of the bones, &c., than in a child at the full term.

6. Offensive discharge from the vagina at the beginning of labour may well excite suspicion that the child is putrid; but an offensive discharge at an advanced period of the labour may come from the maternal passages, irrespective of the child's condition.

7. This sign I consider not to be worthy of any confidence, as such motion can rarely be distinguished under the most favourable circumstances, and the swelling of the tongue would generally prevent our detecting any motion in it.

8. If there be a total absence of pulsation in the funis for some minutes consecutively, we may safely conclude that life is extinct; but if the circulation through the cord be only partially interrupted, life may be preserved for a much longer period. When a fœtus is living it is generally easy to excite reflex movements in the hand or foot, but the reverse of this would in no way establish the fact of its death.

9. The aspect of the woman affords no information whatever on the question before us.

10. Before labour sets in the condition of the mammæ may yield

some small presumptive evidence of the decease of the child, but no change can be looked for if the child perish during the labour.

11. Some slight value may be attached to these signs if they occur before the accession of labour, and are borne out by other symptoms.

12. This condition of the scalp, being a result of decomposition, is a conclusive proof that the fœtus has been some time dead.

Auscultation can often render us very reliable assistance in diagnosing the condition of the fœtus during labour. Under all circumstances the presence of the fœtal heart is, of course, proof that the child is living; but the converse of this proposition is not to be received except under certain conditions and with certain limitations. After the rupture of the membranes a practised obstetric auscultator should always be able to hear the heart of a living fœtus, provided the examination be made under favourable circumstances, and that the sources of error be guarded against. Of these latter the most ordinary are—(1) persistent or very frequent labour-pains; (2) restlessness of the patient; (3) distension of the bladder; (4) distension of the intestines from flatulence,—an occurrence that is very apt to take place in protracted labour. For obviating the first and second of these, chloroform inhalation will generally suffice, and the use of the catheter will remove the third, but the fourth cannot be removed; here we must only make strong pressure with the stethoscope, so as to displace the stratum of air which otherwise would obstruct the transmission of the sounds; and fortunately, this pressure can generally be easily borne by the patient. Now, if the heart's sounds cannot be detected in the absence of these hindrances by a competent auscultator, who patiently and carefully examines in the proper regions, then, under these circumstances, the *negative result* comes to have a *positive significance*, and most strongly corroborates other evidence of the extinction of life in the fœtus. This would receive further and stronger support if successive observations had previously shown the heart to have been getting weaker, and that it had been intermitting or considerably diminished in frequency immediately after each labour-pain: the cessation of the sounds under these circumstances would have all the weight of positive evidence. In transverse presentations I have sometimes—in order to make assurance doubly sure—applied the stethoscope *per vaginam* directly to the thorax of the child, when any pulsation compatible with life could be detected. Some writers

have supposed that, consequent upon the death of the child in utero, there is a perceptible alteration in the character of the placental soufflet, by which we might predicate the cessation of fœtal life. Although my experience with regard to this point does not altogether justify me in asserting that a change in the placental sound never does take place after the death of the fœtus, or at least until some time has elapsed, yet it does fully warrant me in saying that we never could venture to infer from the character of this sound whether the child be alive or dead.

Numb. 2.—*When the Crotchet is to be used.*

Midwifery is now so much improved, that the necessity of destroying the child does not occur so often as formerly. Indeed it never should be done, except when it is impossible to turn or deliver with the forceps; and this is seldom the case but when the pelvis is too narrow, or the head too large to pass, and therefore rests above the brim. For this reason, it is not so necessary for the operator to puzzle himself about dubious signs; because, in these two cases, there is no room for hesitation: for if the woman cannot possibly be delivered in any other way, and is in imminent danger of her life, the best practice is undoubtedly to have recourse to that method which alone can be used for her preservation, namely, to diminish the bulk of the head.

In this case, instead of destroying you are really saving a life; for, if the operation be delayed, both mother and child are lost.

[In this last sentence we have, as it appears to me, a complete justification—*quoad* its moral bearings—of the operation in question, as no amount of casuistry or theological reasoning can destroy the force of the argument that is here laid down. "To him that knoweth to do good, and doeth it not, to him it is sin." (Jas. iv, 17.) The morality of the operation of craniotomy, under any circumstances where the child is not positively known to be dead, has been gravely called in question by divines of the Roman Catholic Church, and was the subject of a sharp controversy here (Dublin) some years ago. Dr. Churchill has written an admirable and ex-

haustive essay on this subject, which appeared in 'Dub. Med. Jour.,' November, 1858. This essay will be found appended to the later editions of his 'Midwifery,' and is well worthy the perusal of every one interested in the question. It is remarkable as being the only one, I believe, ever written upon the same subject by an obstetrician.]

Sect. 6.—*The old Methods of extracting the Head.*

Various have been the contrivances intended for this purpose. Some practitioners, when the head did not advance in the pelvis, introduced the *speculum matricis*, in order to stretch the bones asunder, and thereby increase the capacity of the basin: if, after this operation, the woman could not be delivered with her pains, they fixed a large screw in the head, by which they pulled with great force. Others opened the head with a large bistory, or a short broad-bladed knife in form of a myrtle leaf, or with a crooked bistory with a long handle: then a small pair of forceps with teeth were introduced; and one blade being insinuated into the opening, they laid hold on the skull, and pulled the head along: they likewise made use of different kinds of crotchets both sharp and blunt; and when the head was lower down, they practised the same expedient.

Albucasis has also given the draught of an instrument, which is both for opening and extracting the head; the point and wings are forced through the cranium, and when turned the contrary way the two wings are forced to take hold of the inside.

There are other later contrivances used and recommended by different gentlemen of the profession, such as Mauriceau's tire-tête, Simpson's scalp-ring, and Ould's terebra occulta, with the improvement made in it by Dr. Burton of York: and all these instruments may be used with success, if cautiously managed, so as not to injure

the woman; except the speculum matricis, which, far from answering the supposed intention of it, namely, to extend the bones of the pelvis, can serve no other purpose than that of bruising or inflaming the parts of the woman.

The following method, if exactly followed according to the circumstances of the case, seems, of all others hitherto invented, the easiest, safest, and most certain, especially when it requires great force to extract the head.

Sect. 7.—*The Method of using the Scissors, Blunt Hook, and Crotchet.*

When the head presents, and such is the case that the child can neither be delivered by turning nor extracted with the forceps, and it is absolutely necessary to deliver the woman to save her life, this operation must then be performed in the following manner.

The operator must be provided with a pair of curved crotchets, made according to the improvements upon those proposed by Mesnard, together with a pair of scissors, about nine inches long, with rests near the middle of the blades, and the blunt hook.

[The improvement for which Smellie here and elsewhere gives credit to Mesnard, viz. making the crotchet curved instead of straight and using two at the same time, was found in practice to add considerably to the efficiency of the instrument. Smellie improved upon Mesnard's curved double crotchets, by substituting the lock of his forceps, in place of the clumsy nut-and-pivot connexion by which Mesnard united the two branches after their application. Smellie sometimes used the crotchet guarded with a sheath (described at p. 299), which could easily be removed when required; his 39th table gives drawings of these improved instruments.]

NUMB. 1.—*Of the Woman's Posture.*

The patient ought to be laid on her back or side, in the same position directed in the use of the forceps; the operator must be seated on a low chair, and the instruments concealed and disposed in the same manner and for the same reason mentioned in treating of the forceps. The parts of the woman have already, in all likelihood, been sufficiently dilated by his endeavours to turn or deliver with the forceps: or if no efforts of that kind have been used, because by the touch he had learned that no such endeavours would succeed, as in the case of a large hydrocephalus, when the bones of the cranium are often separated at a great distance from each other, or upon perceiving that the pelvis was extremely narrow; if, upon these considerations, he hath made no trials in which the parts were opened, let him gradually dilate the os externum and internum, as formerly directed.

NUMB. 2.—*Use of Perforating Scissors.*

The head is commonly kept down pretty firm, by the strong contraction of the uterus round the child; but should it yield to one side, let it be kept steady by the hand of an assistant, pressing upon the belly of the woman: let him introduce his hand, and press two fingers against one of the sutures of the cranium; then take out his scissors from the place in which they were deposited, and guiding them, by the hand and fingers till they reach the hairy scalp, push them gradually into it, until their progress is stopped by the rests.

If the head slips aside, in such a manner as that they cannot be pushed into the skull at the suture, they will make their way through the solid bones, if they are moved

in a semicircular turn like the motion of boring, and this method continued till you find the point firmly fixed; for if this is not observed, the points slide along the bones.

The scissors ought to be so sharp at the points, as to penetrate the integuments and bones when pushed with a moderate force; but not so keen as to cut the operator's fingers, or the vagina, in introducing them.

The seissors being thus forced into the brain, as far as the rests at the middle of the blades, let them be kept firm in that situation; and the hand that was in the vagina being withdrawn, the operator must take hold of the handles with eaeh hand, and pull them asunder, that the blades may dilate and make a large opening in the skull; then they must be shut, turned, and again pulled asunder, so as to make the ineision erucial; by which means the opening will be enlarged, and suffieient room made for the introduction of the fingers; let them be afterwards elosed, and introduced even beyond the rests, when they must again be opened, and turned half round from side to side, until the strueture of the brain is so effeetually destroyed, that it can be evacuated with ease. This operation being performed, let the scissors be shut and withdrawn; but, if this instrument will not answer the last purpose, the business may be done by introdueing the erotehet within the opening of the skull. The brain being thus destroyed, and the instrument withdrawn, let him introduce his right hand into the vagina, and two fingers into the opening which hath been made, that if any sharp splinters of the bones remain, they may be broken off and taken out; lest they should injure the woman's vagina, or the operator's own fingers.

[The perforating scissors of Smellie was a far superior instrument to anything previously recommended for the same purpose. But the eutting edges on the opposed surfaces of the blades (which rendered it truly a scissors) were very objectionable, as without incessant

caution its use is dangerous to the operator as well as to the patient. I knew a very experienced and skilful accoucheur, when using this instrument, to cut a piece of the flesh from his left index, whereby his hand was rendered useless for a length of time. By the removal, then, of the scissors edge to the outside, we at once get the modern perforator, of which there have been many modifications, chiefly affecting the shape and construction of the handles. The London Obstetrical Society's Catalogue of Instruments gives engravings of most of these. I myself prefer a perforator with scissors handles, and having a slight curve near the tip of the blades. Simpson's perforator is inconvenient to hold, especially if the head offers much resistance to the introduction of the points; the same applies to Oldham's perforator (the one most used by Dr. Barnes); but once introduced each of them has this advantage, that the action of one hand can separate the blades, whereas in the other kind of perforator, whose handles cross each other, two hands are generally required; this objection, however, has no real weight, for any one's hand can supply the small amount of aid that is needed.]

Numb. 3.—*Hydrocephalic Head.*

If the case be an hydrocephalus, let him fix his fingers on the inside and his thumb on the outside of the opening, and endeavour to pull along the skull in time of a pain; but, if labour is weak, he must desire the woman to assist his endeavours by forcing down; and thus the child is frequently delivered; because, the water being evacuated, the head collapses of course.

Numb. 4.—*Contracted Pelvis.*

But when the pelvis is narrow, the head requires much greater force to be brought along, unless the labour-pains are strong enough to press it down and diminish it by squeezing out the cerebrum; in this case, let the operator withdraw his fingers from the opening, and sliding them along the head, pass the os uteri; then, with his left hand, taking one of the crotchets from the place of its conceal-

ment, introduce it along his right hand, with the point towards the child's head, and fix it above the chin in the mouth, back part of the neck, or above the ears, or in any place where it will take firm hold; having fixed the instrument, let him withdraw his right hand, and with it take hold on the end or handle of the crotchet, then introduce his left to seize the bones at the opening of the skull (as above directed), that the head may be kept steady, and pull along with both hands.

If the head is still retained by the uncommon narrowness of the pelvis, let him introduce his left hand along the opposite side, in order to guide the other crotchet; which being also applied, and locked or joined with its fellow in the manner of the forceps, he must pull with sufficient force, moving from side to side, and as it advances, turn the forehead into the hollow of the sacrum, and extract it with the forceps, humouring the shape of the head and pelvis during the operation, which ought to be performed slowly, with great judgment and caution: and from hence it appears absolutely necessary to know how the head presents, in order to judge how the crotchet must be fixed, and the head brought along to the best advantage.

[The last observation is very true, and yet it is one that too frequently is disregarded by operators. It shows how mindful Smellie was of the importance of attending on all occasions, and under all circumstances, to the mechanical laws of parturition. This close observation of nature it was that enabled him to effect such great improvements in the art of midwifery, and raised him to such pre-eminence among obstetricians.]

Sometimes, in these cases, when I find that I cannot succeed by pulling at the opening with my fingers, and if the woman has not had strong pains, I introduce the small end of the blunt hook into the opening, and placing my fingers against the point on the outside of the skull, pull with greater and greater force; but, as we can seldom take

a firm hold in this manner, if it does not soon answer the purpose, I introduce my fingers, as above, farther, and slide the point up along the outside above the under jaw; and have succeeded several times with this instrument, except when the pelvis was so narrow as to require a greater force; when we must use the others. No doubt, it is better first to try the blunt hook; because the managing the point gives less trouble, and it can be easier introduced with the point to one side. When the instrument is far enough advanced, this point may be turned to the head; and as a very narrow pelvis seldom occurs, the blunt hook will commonly succeed.

Soon after the second edition of this treatise was published, I contrived a sheath to cover the sharp point of the curved crotchets, which may be introduced and used in the same manner as the blunt hook; the sheath may be taken off or kept on as there is occasion.

If, when the head is delivered in this manner, the body cannot be extracted on account of its being much swelled, of a monstrous size, or (which is most commonly the case) the narrowness of the pelvis; let him desist from pulling, lest the head should be separated from the body, and, introducing one hand so as to reach with his fingers to the shoulder-blades or breast, conduct along it one of the crotchets, with the point towards the fœtus, and fix it with a firm application; then withdrawing his hand, employ it in pulling the crotchet, while the other is exerted in the same manner upon the head and neck of the child: if the instrument begins to lose its hold, he must push it farther up, and fixing it again, repeat his efforts, applying it still higher and higher, until the body is extracted.

Some writers direct us to introduce the crotchet within the skull, and, pressing one hand against the point in the outside, pull along. But this is a trifling expedient; and if a good deal of force is used, the instrument tears

through the thin bones, and hurts the operator's hand or the woman's vagina, if not both. Whereas, in the other method, there is much more certainty, and a better purchase to force along the head, which collapses and is diminished as the brain is discharged, and never comes down in a broad flattened form, according to the allegations of some people, whose ideas of these things are imperfect and confused: for, if this were the case, the same would happen when the head is forced down from behind with labour-pains into a narrow pelvis, because the pressure, in both cases, acts in the same direction; whereas we always find, both in the one and the other, that the vertex is protruded in a narrow point, and the whole head squeezed into a longish form.

Although many people have exclaimed against the crotchets as dangerous instruments, from ignorance, want of experience, or a worse principle, as formerly observed; yet I can assure the reader, that I never either tore or hurt the parts of a woman with that instrument. I have indeed several times hurt the inside of my hand by their giving way; till I had recourse to the curved kind, which in many respects have the advantage of the straight; and I am persuaded, if managed as above directed, will never injure the patient.

[My experience entirely coincides with that of Smellie as to the safety with which the crotchet can be used. Like him, I have wounded myself by the slipping of the instrument, but I am convinced that in most cases all risk of such an occurrence can be prevented by attending to these two rules—(1) to pull from the wrist (by flexion of hand), and not from the shoulder; and (2) to let the hand guarding the crotchet become for the time being a part of the latter and follow its movements, so that if it move the hand will simultaneously do the same, in consequence of its position with regard to the crotchet remaining unchanged. Smellie's advice about applying the crotchet on the outside of the head may frequently be followed with great advantage. When so placed, we can, without

risk to the mother, bring a very powerful traction force to bear on the head. To get a secure hold on the interior of the skull is sometimes very difficult, and the frequent slipping of the instrument prolongs the operation. Here it is that a good craniotomy forceps renders very useful aid; though I consider the crotchet an instrument of more power and wider range of utility. A toothed point on the crotchet often enables us to take a better hold with it. The form of crotchet which has generally been employed in the Dublin Lying-in Hospital, and which Barnes commends, is curved, and has a cross handle. With this instrument alone I have oftentimes effected delivery in very contracted pelves.

Neither Smellie's teaching nor practice gives any support to the plan of allowing an interval of some hours to elapse after perforation and before commencing to extract. This practice came into vogue some years after Smellie's death, and was sanctioned by Drs. Kelly, Osborne, and Denman. It is most objectionable, however, on many grounds. I never saw it followed but once, and in that case there was much cause to regret it, as the presentation changed to an arm during the interval, and thereby added incalculably to the difficulty and danger of the delivery. In this instance perforation was called for on account of the obstruction caused by the presence of a solid tumour, which nearly filled the pelvis, leaving only a small space anteriorly through which to extract the fœtus. This remarkable case occurred in the Dublin Lying-in Hospital, and was very fully reported by Dr. Shekleton ('Dub. Quar. Journal,' Nov., 1850).

Simpson and other writers, estimating the prognosis of this operation by the mortality which has followed its performance, have ventured to describe it as a most dangerous and fatal one. But such reasoning is palpably fallacious, for it confounds the *propter hoc* and the *post hoc*, and totally ignores the other and more influential factors which have concurred to bring about the fatal result; the most common of these being undue protraction of the labour and previous unsuccessful attempts at delivery by the forceps or turning. Schroeder makes some sensible remarks on this point, worthy of being quoted: "It cannot be denied that a great number of the women upon whom perforation is performed die. The death is not due to the operation, but to the unfavourable conditions which rendered the operation necessary, and not infrequently, also, to its late performance. Most frequently a fatal issue is observed after

perforation, but not *propter*, but *post*, when it has been performed because delivery could not be terminated by a long and forcible forceps operation. On the whole, perforation is an operation decidedly favourable to the mother." ('Midwifery,' trans. by Carter, p. 198.) Churchill has very carefully investigated this point—the prognosis of craniotomy—and collected 124 cases in which the operation of craniotomy was not complicated, and was performed before the patient was too far reduced. Out of these (some of which were unduly prolonged) only four died; that is one in thirty-one, or a fraction over 3 per cent. ('Midwifery,' 5th edit., p. 799.)]

Indeed, young practitioners, till they are better informed by custom and practice, may, after the head is opened, try to extract it with the small or large forceps; and if it is not very large, or the pelvis very narrow, they may deliver by squeezing and lessening the head: but in my course of practice, I have been concerned in many cases, where the pelvis was so distorted and narrow, that, even after opening the head largely, I have pulled at the bones in time of strong pains, but all to no purpose, although some of them actually came away. Nay, after fixing a crotchet firmly above and near the chin or basis of the skull, and using a good deal of force, I have not been able to move the head lower, till at last I have been obliged to introduce the other, and by intervals increase the force of pulling to the utmost of my strength; and, before we had the curved crotchet, I have been so fatigued from the straight kind slipping their small hold so often, that I have scarcely been able to move my fingers or arms for many hours after; and if this force had not been used, the mother must have been lost as well as the child. See Collect. XXXI, and Tab. XXVIII, XXXIX.

[Since Smellie's time another and entirely new agency has been brought to our aid in the performance of this operation, viz. crushing of the child's head, whereby it is rendered so plastic and compressible as to admit of being drawn through the pelvis with little pressure on the maternal structures. This is what the cephalotribe

is designed to accomplish, and the proper time for its application is after perforation and before extraction. To use the instrument for extracting the head, if any degree of force be required, is an abuse of it.]

CHAPTER IV.

OF PRETERNATURAL LABOURS.

SECT. 1.—*Definition and divisions.*

PRETERNATURAL labour, according to the division mentioned, chap. i, sect. 5, happens when, instead of the head, some other parts of the body presents to the os uteri. It has been thought by some, that all labours in which the forceps and crotchet are used ought to be ranked in this class; because the head is certainly delivered by preternatural means; and that, when the feet or breech present, and the woman is delivered without any other assistance than that of labour-pains, the case ought to be accounted natural. However, this division would embarrass and confuse the young beginners more than the other which I have chosen to follow, namely, that of reckoning by the manner in which the child is delivered, and calling all those births *preternatural* in which the body is delivered before the head.

[This definition, it will be observed, is in strict accordance with what was laid down at page 196; though apparently not quite conformable to that at the beginning of the present section.]

Preternatural labours are more or less difficult according to the presentation of the child, and the contraction of the uterus round its body. The nearer the head and shoulders are to the os internum or lower part of the uterus, the more difficult is the case; whereas when the head is towards

the fundus, and the feet or breech near the os internum, it is more easy to turn and deliver.

To begin with the easiest of these first, it may be proper to divide them into three classes. First, how to manage when the feet, breech, or lower parts present. Secondly, how to behave in violent floodings; and, when the child presents wrong before the membranes are broke, how to save the waters in the uterus, that the fœtus may be the more easily turned; and what method to follow even after the membranes are broke, when all the waters are not evacuated. Thirdly, how to deliver when the uterus is strongly contracted, and the child presenting either with the fore or back parts, and lying in a circular form; or with the shoulders, breast, neck, face, ear, or vertex, and lying in a longish form, with the feet and breech towards the fundus of the womb, which is contracted like a long sheath, close to the body of the fœtus; and when the fore parts of the child lie towards the side, fundus, fore or back part of the uterus. Deventer, who practised at Dort in Holland, alleges, that preternatural as well as laborious cases proceed from the wrong position of the os and fundus uteri; that if the fundus hangs forwards over the os pubis, the os uteri is turned backwards towards the sacrum; and that, in whatsoever direction the fundus inclines, the os uteri will be always turned to the opposite side. This opinion he grounded upon the supposition that the placenta always adheres to the fundus; but experience shows, that it adheres to different parts of the womb, sometimes even to the inside of the os uteri. For the most part, indeed, the os internum is turned backwards towards the coccyx, being in a straight line with the fundus up to the middle space betwixt the navel and scrobiculus cordis.

Deventer was also of opinion, that if, upon touching, the mouth of the womb was not felt in the middle, the woman ought to be assisted by opening the parts; and if

this did not succeed, by turning and delivering by the feet without delay. We sometimes, indeed, meet with pendulous bellies, in which the os uteri is farther back than usual; but even in these cases, when the head is not very large, nor the pelvis narrow, and the patient is vigorous and the labour-pains strong, the woman, with a little patience, is for the most part safely delivered without any other than common assistance: or should the case prove tedious, she may be assisted in time of a pain by introducing one or two fingers into the os uteri, and gradually bringing it more forwards. When the belly is very pendulous, change of position from time to time is of service, especially lying upon her back, with the shoulders low and the breech raised.

In women that are distorted, when one ilium is much lower than the other, the fundus uteri will be turned to the low side; but there the chief difficulty will proceed from the narrowness of the pelvis.

Sect. 2.—*First Class of Preternatural Labours; the Feet or Breech of the Fœtus presenting and the Head, Shoulders, and upper Parts towards the Fundus.*

These, for the most part, are accounted the easiest, even although the uterus should be strongly contracted round the body of the child, and all the waters discharged.

If the knees or feet of the child present to the os internum, which is not yet sufficiently dilated to allow them and the body to come farther down; or, if the woman is weak, wore out with long labour, or endangered by a flooding; let the operator introduce his hand into the vagina, push up and stretch the os uteri, and bring along the feet; which being extracted, let him wrap a linen cloth round them, and pull until the breech appears on the outside of the os

externum. If the face or fore part is already towards the back of the uterus, let him persist in pulling in the same direction; but if they are towards the os pubis or one side, they must be turned to the back part of the uterus; and as the head does not move round equal with the body, he must make allowance for the difference in turning, by bringing the last a quarter farther than the place at which the head is to be placed; so that the face or forehead which was towards one of the groins, will be forced to the side of the sacrum, where it joins with the ischium. This quarter turn of the body must be again undone, without affecting the position of the head; a cloth may be wrapped round the breech, for the convenience of holding it more firmly; then placing a thumb along each side of the spine, and with his fingers grasping the belly, let him pull along the body from side to side, with more or less force according to the resistance.

[At this stage of the delivery the necessity for expediting matters may be estimated by the state of the funic pulsations. Here as at every other period of the birth it is best to proceed slowly and deliberately, unless there be special and urgent need of haste. I am fully persuaded that more children are lost in breech and footling cases from the too rapid extraction of the body than from anything else. To an ill-instructed or inexperienced practitioner, the temptation to grasp the legs and pull away at the child is irresistible. Even Smellie erred in this respect—so great is the influence of custom and authority; and this hurtful practice of pulling down the child as soon as the leg was in reach, continued to be the rule for long after Smellie's time.]

When the child is delivered as far as the shoulders, let him slide his hand, flattened (suppose the right if she lies on her back) between its breast and the perineum, coccyx, and sacrum, of the woman, and introduce the fore or middle finger (or both, if necessary) into the mouth of the fœtus; by which means the chin will be pulled to the breast, and

the forehead into the hollow of the sacrum. And this expedient will also raise upward the hindhead, which rests at the os pubis.

When the forehead is come so low as to protrude the perineum, if the woman lies on her back, let the operator stand up and pull the body and head of the child upwards, bringing the forehead with a half-round turn from the under part of the os externum, which will thus be defended from laceration. The application of the fingers in the child's mouth will contribute to bring the head out in this manner, prevent the os externum from hitching on the chin, help along the head, and guard the neck from being overstrained; a misfortune which would infallibly happen if the forehead should be detained at the upper part of the sacrum. Nor is there any great force required to obviate this inconvenience, or the least danger of hurting the mouth, if the head is not large; for if the head cannot be brought along with moderate force, and the operator is afraid of injuring or over-straining the lower jaw, let him push his fingers farther up, and press on each side of the nose, or on the inferior edges of the sockets of the eyes. If the legs are come out, and the breech pulled into the vagina, there is no occasion for pushing up to open, but only to pull along and manage as above directed; still remembering to raise the forehead slowly from the perineum, which may be pressed back with the fingers of his other hand.

In the case of a narrow pelvis, or large head, which cannot be brought along without the risk of overstraining the neck, let him slide up his fingers and hand into the vagina, and bring down one of the child's arms, at the same time pulling the body to the contrary side, by which means the shoulder will be brought lower down: let him run his fingers along the arm, until they reach the elbow, which must be pulled downwards with an half-round turn to the other side, below the breast. This must not be done

with a jerk, but slowly and cautiously, in order to prevent the dislocation, bending, or breaking, of the child's arm.

Let him again guide his fingers into the child's mouth, and try if the head will come along; if this will not succeed, let the body be pulled to the other side, so as to bring down the other shoulder; then slide up his left hand, and, extracting the other arm, endeavour to deliver the head. If one finger of his right hand be fixed in the child's mouth, let the body rest on that arm; let him place the left hand above the shoulders, and put a finger on each side of the neck; if the forehead is towards one side at the upper part of the pelvis, let him pull it lower down, and gradually turn it into the hollow of the sacrum; then stand up, and in pulling raise the body so as to bring out the head in an half-round turn, as above directed.

Deventer and others, from a mistaken notion that the chief resistance is at the coccyx or lower part of the pelvis, have directed us to press the shoulders of the child downwards, so as to bring the hindhead first from below the os pubis; not considering that the resistance is occasioned by the thickest part of the head being detained at the upper part of the pelvis, where the lowest vertebra of the loins and the upper part of the sacrum jet inwards; and that, until the forehead hath passed into the hollow of the sacrum, this method cannot succeed. The business, therefore, is to pull upwards at the back part of the neck, which rests against the under part of the os pubis; and by this exertion, the forehead, which is high up, will be brought down with a circular turn; after which the head seldom stops, and the same circular motion is still the most proper, though now we can bring out the head the other way, but not before. Sometimes, indeed, I have found Deventer's method succeed better than the other, when the head is low down, and the chief resistance is in the lower parts;

but this is very seldom the case; however, when the forehead is hindered from coming down into the lower part of the sacrum by an uncommon shape of the head or pelvis, and we cannot extract it by bringing it out with an half-round turn at the os pubis, we must try to make this turn in the contrary direction; and instead of introducing our fingers into the child's mouth, let the breast of it rest on the palm of your left hand (the woman being on her back), and placing the right on its shoulders, with the fingers on each side of the neck, press it downwards to the perineum. In consequence of this pressure, the face and chin being within the perineum, will move more upwards, and the head come out with an half-round turn from below the os pubis; for the centre of motion is now where the fore-part of the neck presses at the perineum; whereas, in the other method, the back part of the neck is against the lower part of the os pubis, on which the head turns.

If the forehead is not turned to one side, but sticks at the upper part of the sacrum, especially when the pelvis is narrow; let him endeavour, with his finger in his mouth, to turn it to one side of the jetting-in of the sacrum, because the pelvis is wider at the sides of the brim, and bring it along as before.

If one of the child's arms, instead of being placed along the side of the head, is turned in between the face and sacrum, or between the hindhead and os pubis, the same difficulty of extracting occurs as in a large head or narrow pelvis; and this position frequently ensues when the fore parts of the child's body are turned from the os pubis down to the sacrum. If they are turned to the left side of the woman, the left hand and arm are commonly brought in before the face, and *vice versâ;* but in these cases the elbow is for the most part easily come at, because it is low down in the vagina, and then there is a necessity for bringing down one or both arms before the head can be delivered:

from whence we may conclude, that those authors are sometimes in the wrong who expressly forbid us to pull down the arms. Indeed, if the pelvis is not narrow, nor the head very large, and the arms lie along the sides of the head, there is seldom occasion to pull them down; because the pelvis is widest at the sides, and the membranes and ligaments that fill up the space betwixt the sacrum and ischia yield to the pressure, and make room for the passage of the head: but when they are squeezed between the head and the sacrum, ischia, or ossa pubis, and the head sticks in the pelvis, they certainly ought to be brought down; or even when the head comes along with difficulty. Neither is the alleged contraction of the os internum round the neck of the child so frequent as hath been imagined; because for the most part the contraction embraces the head and not the neck: but should the neck alone suffer, that inconvenience may be removed by introducing the hand into the vagina, and a finger or two into the child's mouth, or on each side of the nose; by which means also a sufficient dilatation will be preserved in the os externum, which frequently contracts on the neck as soon as the arms are brought out.

[The minuteness and accuracy with which our author describes the mode of conducting the delivering, cannot be too highly praised. Scarcely a point of any practical importance is overlooked. Even the posterior displacement of the arm (described by Simpson and Cazeaux when occurring in head presentations) is recognised among the causes of difficulty in the extraction of the after-coming head, and his explanation of the cause of its production is essentially the same as that assigned by Barnes, who gives an illustration to show this "nuchal hitching of the arm." (*Op. cit.*, p. 200.) On two points however, the modern practice differs somewhat from that of Smellie, and is a decided improvement upon it, viz. (1), in abstaining from efforts to hasten the birth of the body; and (2), in bringing down the arms, as a general rule, before making attempts to extract the head. The only exception I would make to this latter precept is

in premature births. Here spasmodic contraction of the os is apt to occur and to prove a cause of delay, not by embracing the neck, however, as some authors would have us believe, but, as Smellie correctly states, by embracing the head. In a few instances where this has occurred to me, I found the constriction to be around the head just below the occiput posteriorly, and above the nasal bones anteriorly; and the resistance thus opposed to the escape of the head was by no means trifling. The danger to the fœtus in delivering by the pelvic extremity is very considerable, especially in primiparæ, and is usually ascribed to pressure on the funis: to lessen the danger from this cause, the funis should be drawn down and placed, if possible, at the side of sacrum not occupied by the forehead. But this is not the only source of danger to the child; there is another which has escaped the notice of authors, but has been pointed out by the late Professor Hugh Hodge, viz., the separation of the placenta from the uterus before the head is delivered. "This seems to me," he writes, "by far the most frequent reason why children so often perish in pelvic deliveries, and why so little confidence should be placed in attempting to remove the cord from pressure." ('Journal of Obstetrics,' May, 1875.)]

The diameter from the face or forehead to the vertex, being greater than that from the forehead to the back-part of the hindhead or neck, when the hindhand rests at the os pubis, and the forehead at the upper part of the sacrum, the head can seldom be brought down until the operator, by introducing a finger into the mouth, moves the same to the side, brings the chin to the breast, and the forehead into the hollow of the sacrum: by which means the hindhead is raised and allowed to come along with greater ease; and in pulling, half the force only is applied to the neck, the other half being exerted upon the head, by the finger which is fixed in the mouth; so that the forehead is more easily brought out, by pulling upwards with the half-round turn from the perineum. When the operator with his fingers in the child's mouth cannot pull down the forehead into the hollow of the sacrum, let him push the fore-finger of his left hand betwixt the neck and os pubis, in order to raise

the hindhead upwards; which being done, the forehead will come down with less difficulty, especially if he pushes up and pulls down at the same time, or alternately.

[Further directions for the management of the head, when there is unusual difficulty in its extraction, will be found in Section 5 of this chapter.]

If it be discovered by the touch that the breech presents, that the membranes are not yet broke, the woman is in no danger, the os internum not yet sufficiently dilated, and the labour-pains strong; the midwife ought to wait until the membranes, with the waters, are pushed farther down, as in the natural labour: for, as they come down through the os uteri into the vagina, they stretch open the parts contained in the pelvis; and the bulk within the uterus being diminished, it contracts and comes in contact with the body of the child; so that the breech is pushed along by the mechanical force of the abdominal muscles operating upon the womb.

The same consequence will follow even although the membranes are broke; for the waters lubricate the parts as they flow off, and the breech, if not too large, or the pelvis narrow, is pushed down. In this case, when the nates present equal and fair to the os uteri (as was formerly observed when treating of the position of the child, Book III, chap. i, sect. 1), it is most probable that one side of the fœtus was towards the fore-part and the other to the back-part of the uterus; so it is also reasonable to conclude, that when the breech presents, it lies in the same manner, but that the fore-parts of the child are rather turned backwards to one side of the vertebræ of the loins: in this position, one hip will present, and the other rest on the os pubis; but when forced along with pains, the last will be gradually moved more and more to the groin of that side, and from thence slip down at the side of the basin: the

lower at the same time will be forced to the other, and the hollow betwixt the thighs will rest upon the jetting-in of the os saerum, and eome down in that matter; the thighs on each side, and the baek and round part of the breeeh, passing in below the areh of the os pubis, whieh is the best position: but if the back of the child is tilted baekwards, then it will be forced down in the contrary direetion, and eome along with more diffieulty, viz. the thighs to the os pubis, and baek to the saerum.

[The foregoing description of the mechanism of breech presentation is not very correct in its details. When he says, "One hip will preseut and the other rest on the os pubis," it is not easy to understand him. The word *hip* may mean the ischium, the great trochanter, or the anterior part of the crest of the ilium, this last being sometimes called the haunch. Whichever of these be meant, it is certain that the *hip* next the pubis must properly be the presenting part. Smellie may be, to a certain extent, correct in the above statement, as there is a period in many breech cases when the buttock next sacrum is the lower down of the two, and might, therefore, be said to present. This was observed in Case 305; whereas in other cases (*e.g.* 356), he states that the hip next pubis was presenting. The anterior superior spine of the ilium is sometimes found presenting behind pubes at the beginning of labour, and here the diagnosis is not so easy as when a buttock presents, and is apt at first to be mistaken for a shoulder or elbow. Case 356 was of this nature, I think, and on examination, he was at a loss to know whether "the shoulder or haunch presented." In Case 349, this same part seems to have presented, for he says it felt "very much like the shoulder blade;" and he adds, "on examining a second time, I found it was one of the hip bones."]

When it eomes down to the middle or lower part of the pelvis, let the operator introduce the fore-finger of each hand, along the outside, to the groins; and taking hold, pull gently along during a strong pain.

If the os externum is so contraeted that he cannot take sufficient hold, let it be opened slowly, so as to allow his

hands to be pushed up with ease: when he has insinuated a finger or two in each groin, let him place his thumbs on the thighs, if they are towards the ossa pubis, so as to obtain a firm hold; then pull along from side to side, and, if the back of the child is to the os pubis, continue to assist in this manner until the body and head are delivered. The legs being commonly stretched up along the belly and breast, when the child is extracted as far as the shoulders, they come out of themselves, or are easily brought down; but if the belly of the child is turned to one side, or to the os pubis, in that case, when the breech is delivered, he ought to turn the belly down to the sacrum and the back to the os pubis; and that the face may be also turned to the back of the mother, let him remember the quarter extraordinary, which must be again reversed, and then he may pull along and deliver.

If the body cannot be turned until the thighs and legs are brought down, either on account of the bulk, or because the hold on the breech is not sufficient, let him continue to pull along, until the hams appear on the outside of the os externum; then seize one of the knees with his finger and thumb, and extract that leg; and let the other be brought down in the same manner.

[It is generally best to leave the legs alone, for they form some protection to the cord as long as they remain up; but as soon as the feet have cleared the vulva then the most critical moment for the child has arrived, and active interference becomes necessary.]

If he attempts to pull out the legs before the hams arrive at this place, the thighs are always in danger of being bent or broken. When the legs are delivered, let him wrap a cloth round the breech of the child: and as the body was pulled down almost as far as the breast, before the legs could be brought out, it must be pushed up again to the navel, or above it; because, without this precaution, the shoulders would be so much engaged in the pelvis, that

it would be impracticable to make the motions formerly directed, so as to turn the face to the back of the mother: whereas, when the body is pushed up, those turns can be effected with greater ease, because the belly being in the pelvis, it yields easier to the form of the basin. When the face is turned properly down, let him proceed to deliver as above directed.

If the breech is detained above the pelvis, either by its uncommon magnitude or the narrowness of the basin; or if one of the nates is pushed in, while the other rests above the os pubis, sacrum, or to either side; if the woman is low and weak, the pains lingering and insufficient to force the child along; or if she is in danger from a violent flooding: in any of these cases, let him (during every pain) gradually open first the os externum, and then the os internum, with his fingers and hand. Having thus gained admission, let him push up the breech to the fore or back part, or to one side of the uterus, that his hand and arm may have room to slide along the fore-parts or belly of the child, so as to feel the thighs, that will direct him to the legs, which must be brought down with his fingers, while at the same time he pushes up the hams with his thumb, that in case the legs lie straight up they may be extracted with more ease by the flection of the knee, and run the less risk of being bent, broken, or overstrained; for if they are folded downward, they are the more easily brought out.

If the breech be strongly pressed into the upper part of the pelvis, let him also push it upwards and to one side, that his hand and arm may have free passage; for the higher the breech is raised out of his way, he will be at more freedom to extract the legs.

If both legs cannot be easily brought down, he may safely deliver with one, of which taking hold with a linen cloth wrapped round it, let him slide up his other hand

into the vagina, and a finger or two into the outside of the groin which is bent; by these means the hip will come down the easier, and the leg which is already extracted, will not be overstrained by sustaining the whole force of pulling the body along.

[It is mostly in cases of disproportion that the breech is detained at the brim, and that we are compelled to bring down a leg in order to accomplish delivery. The advantage of this proceeding is not so much the reduction of bulk which is effected—though something is effected in this way—as that it supplies us with a very good hold for pulling down the trunk. If the legs are flexed upon the thighs, the foot will be reached not far from the os uteri; but, on the other hand, if the legs be extended upwards, very much difficulty may be encountered in the efforts to reach the foot and bring it into the vagina. Ould well knew the difficulty of these cases, and he advises that "each leg must be taken separately and the knee bent." ('Midwifery,' p. 112.) In addition to this, we must, as Barnes recommends, apply the finger to the instep. "It is of no use," he remarks, "to attempt to bend the leg by acting upon the thigh or knee. You must, therefore, carry your finger nearly to the fundus of the uterus." If the child be dead, I would extract the breech with the blunt hook, in preference to forcing up the hand to the fundus and bringing down a leg. Of course when this latter proceeding is carried out, chloroform should be given freely in order to promote uterine relaxation. Where we can exercise a choice of the leg to seize, I would prefer the one farther removed from the pubes. Smellie repeatedly gives directions for rotating the trunk so as to bring the face posteriorly, and describes his doing it in many of the cases. No doubt this artificial rotation was often necessitated by the meddlesome treatment these patients were subjected to; but I have almost never seen a case where nature, if left alone, failed to bring about the rotation in question, before the head began to engage in the pelvis.]

If the legs lie towards the left side of the woman, who is laid on her back, the right hand must be introduced into the uterus; if they lie to her right side, the left hand will better answer the purpose; and if they are towards her back or belly, either hand may be indifferently used.

In all cases where the breech presents, the safest practice is always to push up and bring down the legs, provided the os uteri is sufficiently dilated, and the waters not wholly discharged.

[Except in cases where there is a considerable contraction of the pelvis, the practice here laid down is not only unnecessary, but hurtful to mother and child. It is surprising that Smellie should in this matter have adhered to the old rule of practice, for he himself admits (Case 316) that he "had several cases, in which the nates presented and the children, where small, have been delivered safely with the labour-pains."]

If the waters are evacuated the uterus strongly contracted around the child, the breech so low as that it cannot be returned, or so small as to come easily along, we ought then to deliver it accordingly; but if so large as neither to be pushed up nor brought along with the assistance of the fingers, let the operator introduce the curved handle of the blunt crotchet into one of the groins, his fingers into the other, and pull very cautiously in order to prevent a fracture or dislocation of the thigh-bone, which might otherwise happen from the use of this instrument, the blunt point of which must be sufficiently past the groin. A fillet may also be used for the same purpose.

I have, in the foregoing cases of this section, supposed the woman laid on her back, her legs supported, and breech to the bed-side; this being generally the best position for delivering the body and head. Indeed, when the child is small, she may lie on her side, and the same methods be used in delivering, provided the operator still remembers that in this position the ilium and ischium of one side are down, and the others up. Besides, when the breech is pushed up, in order to bring down the legs, if they lie forwards towards the fore part of the uterus, and the belly is pendulous, he can reach them with the greatest ease when she lies on one side; or, if the resistance is very

great, turn her to her knees and elbows, according to Deventer's method; but when the legs are delivered, if the child is large or the pelvis narrow, she ought to be turned upon her back, because the body and head can be better and more safely delivered by pulling up and down; and in that posture she is also kept more firm, and her thighs less in the operator's way, than when she lies upon her side. See Collect. XXXII.

[With regard to Deventer's method of extracting the head, I can understand that when the child's head is small, and only meets with resistance from the soft parts, that it may be delivered after this method. In Cases 305, 366, and 373, Smellie successfully followed the plan of Deventer, but he admits that these children were small. In Cases 350, 363, and 367, he tried the same plan, but failed. Although I have never tried this plan, yet there are two facts which make me hesitate to condemn it: (1), by traction of the neck of the fœtus, we can exert more direct influence upon the occiput than upon the forehead, owing to the spine being nearer that end of the head; and (2), I have often found in extracting a large tumour, or globe pessary, that by pulling it backwards I have succeeded in bringing it through the tight and resisting vulva. When, as I have already stated, the resistance to the escape of the head is due solely to the perineum and soft parts, the method of Deventer may probably have some advantage.]

Sect. 3.—*The Second Class of Preternatural Labours.*

When the membranes are broke, but the face, shoulder, or some other part of the child, being pushed into the pelvis, locks up the os internum, so as that a small quantity of the waters hath been discharged, the uterus is kept from contracting strongly round the child, which is therefore more easily turned than it possibly can be when they are all gone:

When, before the membranes are broke, the child is felt through them, presenting wrong; and at the same time the pains push them down so as to dilate the os internum, more or less:

When the woman at any time in the four last months is seized with a violent flooding that cannot be restrained, and unless speedily delivered must lose her life; if labour-pains cannot be brought on by stretching the parts, delivery must be forced; but if she is in labour, and the membranes have been pushed down with the waters, they may be broke; by which means the flooding is frequently diminished, and the child delivered by the labour-pains.

In these three different cases, if we can prevent the strong contraction of the uterus, by keeping up the waters, we can also, for the most part, turn the child with great ease, even in the very worst positions.

[It must be confessed that the difference between the first and second of these orders is not of sufficient importance to ground any classification upon it. The fact of the membranes having ruptured, should certainly make us avoid unnecessary delay in proceeding to operate, but beyond this, its influence would not extend.]

Numb. 1.—*Turning with membranes broken, but the waters partly retained.*

In the first case, let the operator slowly introduce his hand into the vagina, and his fingers between that part of the child which is pushed down and the os internum: if in so doing he perceives some of the waters coming along, he must run up his hand as quickly as possible into the uterus, betwixt the inside of the membranes and the child's body; the lower part of his arm will then fill up the os externum like a plug, so that no more of the waters can pass; let him turn the child with its head and shoulders up to the fundus, the breech down to the lower part of the uterus, and the fore-parts towards the mother's back; let the hand be pushed no farther up than the middle of the child's body; because if it is advanced as high as the fundus, it must be withdrawn lower before the child can be turned;

and by these means the waters will be discharged, and the uterus of consequence contract so as to render the turning more difficult.

Numb. 2.—*Turning with membranes entire.*

In the second case, when the membranes are not broke, and we are certain that the child does not present fair, if the os internum is not sufficiently dilated, and the woman is in no danger, we may let the labour go on until the parts are more stretched; lubricating and extending the os externum, by degrees, during every pain. Then introducing one hand into the vagina, we insinuate it in a flattened form, within the os internum, and push up between the membranes and the uterus, as far as the middle of the womb. Having thus obtained admission, we break the membranes, by grasping and squeezing them with our fingers; slide our hand within them, without moving the arm lower down; then turn and deliver as formerly directed; but if in any of these cases you find the head is large, or the pelvis narrow, bring down the head into the natural position, and assist as directed in lingering or laborious cases.

[Here, as in many other places, Smellie takes occasion to reiterate the caution against attempting delivery by podalic version if we find the pelvis narrow or the head unusually large. The operation of turning when the membranes are entire and the os uteri sufficiently dilated is a very simple affair. It is not of much importance which hand is used; but, for the reasons so well pointed out by Mr. Roberton, viz., that with the patient lying on left side the left hand can be more conveniently passed up in the axis of the uterus —I always use the left hand. I have generally found it advantageous to pass the hand some way up (unless the placenta intervened) between the uterus and membranes before piercing the latter.]

Numb. 3.—*Flooding in last four months.*

If a woman (in the third case) is attacked with a violent flooding, occasioned by a separation of all or any part of the placenta from the uterus during the last four months of pregnancy, and every method has in vain been tried to lessen and restrain the discharge, according to the directions at p. 165, the operator ought to pronounce the case dangerous, and prudently declare to the relations of the patient, that unless she is speedily delivered both she and the child must perish; observing at the same time, that by immediate delivery they may both be saved; let him also desire the assistance and advice of some person eminent in the profession, for the satisfaction of her friends and the support of his own reputation. When there are no labour-pains, and the mouth of the womb is not dilated, it is sometimes very difficult to deliver, more especially if the os internum is not a little lax, but feels rigid.

If the os uteri is so much contracted that the finger cannot be introduced, some authors have recommended a dilator, by which it may be gradually opened so as to admit a finger or two. Doubtless, some cases may happen in which this may be necessary; though in all those to which I have been called, when there was a necessity for forcing delivery, the mouth of the womb was open enough to receive the tip of my finger, so that by gradual efforts I could effect a sufficient dilatation; and it is certainly a safer method to dilate with the fingers and hand, than with an instrument. If in stretching the os internum labour-pains are brought on, let the operator slowly proceed and encourage them; when the mouth of the womb is opened, if the head presents and the pains are strong, by breaking the membranes the flooding will be diminished; but if she

floods to such a degree as to be in danger of her life, and the dilatation does not bring on labour, at least not enough for the occasion, she must be immediately delivered in the following manner. But in the first place let her friends be apprised of the danger, and the operator beware of promising to save either mother or child; for I have known the woman die in a few minutes after delivery, although to all appearance she seemed able to undergo the operation, and the child lost from the head sticking in the pelvis; others, again, who were apparently much more weak and exhausted, have recovered, and the child hath been saved.

The operator having performed his duty in making the friends acquainted with the situation of the case, must gently open the os externum, by introducing his fingers gradually, turning them half round and pushing upward; then forming them with the thumb into the figure of a wedge or cone, continue to dilate slowly and by intervals, until his hand is admitted into the vagina; having thus far gained his point, let him insinuate, in the same slow cautious manner, first one, then two fingers into the os internum, which may be dilated so as to admit the other two and the thumb, in the same conical form, which will gradually make way for sliding the hand along between the outside of the membranes and inside of the uterus; then he must manage as directed in the second case. If upon sliding up his hand upon the outside of the membranes, he feels the placenta adhering to that side of the womb, he must either withdraw that hand and introduce the other on the opposite side, or break through the membranes at the lower edge of the placenta.

The greatest danger in this case frequently proceeds from the sudden emptying of the uterus and belly; for when labour comes on of itself, or is brought on in a regular manner, and the membranes are broke, the flooding is gradually diminished; and first the child, then the placenta,

is delivered by the pains; so that the pressure or resistance is not all at once removed from the belly and uterus of the woman, which have time to contract by degrees; consequently those fainting fits and convulsions are prevented which often proceed from a sudden removal of that compression under which the circulation was performed.

In order to anticipate these fatal symptoms, I have (sometimes successfully) ordered an assistant to press upon the woman's belly while the uterus was emptying; or, after having broken the membranes, turned up the head to the fundus, and brought down the legs and breech, I withdraw my arm a little to let the waters come off, though I keep my hand in the uterus for a few minutes, and do not extract the legs until I feel the womb close contracted to the child; nay, if the flooding is stopped, or even diminished, I let the child remain in the uterus perhaps ten or fifteen minutes longer, then deliver; and, if the hæmorrhagy is stayed, leave the placenta to be expelled by nature. In all these stages, however, when the flooding is violent, we must deliver without loss of time, remembering still the pressure upon the abdomen; for the woman is frequently so very weak, that although labour could be brought on, she would not have strength sufficient to undergo it.

The younger the woman is with child, the greater is the difficulty in opening the os internum; and more so in the first child, especially if she is past the age of thirty-five.

We should never refuse to deliver in these dangerous cases, even although the patient seems expiring; for immediately after delivery the uterus contracts, the mouths of the vessels are shut up, so that the flooding ceases, and she may recover, if she lives five or six hours after the operation, and can be supported by frequent draughts of broth, jelly, caudle, weak cordial, and anodyne medicines, which

maintain the circulation and gradually fill the empty vessels.

[Under the circumstances here described of extreme collapse, threatening life, we can employ, in addition to the remedies mentioned—heat to the surface, stimulating and nutritive enemata, transfusion, and hypodermic injection of sulphuric ether. The last has been found a most powerful means of arousing the vital energies where there is great nervous exhaustion; and it promises to be a therapeutic agent of immense value. If the further experience of the remedy prove to be as satisfactory as in the cases where it has already been tried, it will to a very great extent supersede transfusion, over which operation it possesses some obvious and great advantages.]

If, in time of flooding, she is seized with labour-pains, or if, by every now and then stretching with your fingers the os internum, you bring on labour, by which either the membranes or head of the child is pushed down and opens the os internum, the membranes ought to be broken; so that, some of the waters being discharged, the uterus may contract and squeeze down the fœtus. This may be done sooner in those women who have had children formerly, than in such as have been in labour before. If, notwithstanding this expedient, the flooding still continues, and the child is not like to be soon delivered, it must be turned immediately; or, if the head is in the pelvis, delivered with the forceps; but, if neither of these two methods will succeed, on account of the narrowness of the pelvis or the bigness of the head, this last must be opened and delivered with the crotchet. In all these cases let the parts be dilated slowly and by intervals, in order to prevent laceration. See Collect. XVIII and XXXIII.

[Owing to a defect, already noticed, in Smellie's classification of labours, the subject of hæmorrhage could not be fully treated here, and in order to comprehend his views on it, one should read his observations at p. 165, with the cases in Collection XVIII; and the present division, with the cases in Collection XXXIII, Number 2.

He was quite aware (see page 167) that the placenta might be partially or entirely adherent over the os uteri. He also recognises the difference between accidental and unavoidable hæmorrhage (though not under these names); and, that rupturing the membranes will generally suffice to check the bleeding in the former case.]

Sect. 4.—*The Third Class of Preternatural Labours.*

We have already observed, that the principal difficulties in turning children and bringing them by the feet, proceeded from the contraction of the uterus and bad position of the fœtus. If the child lies in a round form, whether the fore parts are towards the os internum, or up to the fundus uteri, we can for the most part move it with the hand, so as to turn the head and shoulders to the upper part, and the breech and legs downwards; but if the child lies lengthwise, the womb being contracted around it like a long sheath, the task is more difficult; especially if the head and shoulders of the child are down at the lowest part of the uterus, with the breech and feet turned up to the fundus.

Before I proceed to the method of delivery in the following cases, it will not be improper to premise, that the woman ought to be laid on her back, her breech upon the side or foot of the bed, a bolster or pillows being laid below the feather-bed or mattress, in order to raise it so as that the breech may be higher than the shoulders; while an assistant sits on each side, to support her legs and thighs, as directed in chap. ii, sect. 1, chap. iii, sect. 3, and one or two more assistants ought to sit behind, or on each side of her shoulders, to keep her firm in that position. The operator ought to avoid all formality in point of dress, and never walk about the room with sleeves and apron; for although such apparatus may be necessary in hospitals, in private practice it conveys a frightful idea to the patient and female spectators: the more genteel and commodious

dress is a loose washing night-gown, which he may always have in readiness to put on when he is going to deliver; his waistcoat ought to be without sleeves, that his arms may have more freedom to slide up and down under cover of the wrapper; and the sleeves of his shirt may be rolled up and pinned to the breast of his waistcoat.

In natural labours, the sheet that hangs over the bedside is sufficient to keep him clean and dry, by being laid in his lap; but in those cases where he is obliged to alter his position, a sheet ought to be tucked round him, or an apron put on, but not before he is about to begin his work.

If the patient is laid on a low bed, and he intends to introduce his right hand, his best and firmest position is to kneel with his left knee on a cushion, keeping up the right to support his arm; if the left hand is introduced, the reverse of this disposition must take place; if the bed or couch is high, he ought to stand, but still remember to support the elbow on the knee. These directions, however trivial they may seem to old practitioners, may be serviceable to young beginners.

["To avoid all formality in points of dress" is a most excellent rule on these and all other occasions when about to operate; but how to reconcile with it the wearing of a "loose washing night-gown," or how this can be regarded as "more genteel and commodious," I am rather at a loss to perceive. Some of Smellie's detractors insinuated that he adopted this dress—a sort of approach to female attire—out of compliment to the female practitioners and to appease their hostility against him. In the present day, as the patient is generally under the influence of some anæsthetic, the operator is free to arrange his dress as he may think proper.]

The hand of the accoucheur or operator being introduced into the uterus, if he finds the breech below the head and shoulders, let him search for the legs and bring them down; but if the breech be higher than the upper parts of the child, or equal with them, he must try to turn the head

and shoulders to the fundus, and the breech downwards, by pushing up the first and pulling down the last; then proceed with delivery as before directed. This is commonly executed with ease, provided some part of the waters still remain in the uterus; but if the woman has been long in labour, and the waters discharged, the contraction of the womb is so strong, that the child cannot be turned without the exertion of great force frequently repeated. In this case, the easiest method, both for the patient and operator, is to push up the hand gradually on that side to which the legs and thighs are turned; and even after he has reached them, if they are not very high up, let him advance his hand as far as the fundus uteri; he will thus remove the greatest obstacle, by enlarging the cavity of the womb, so as more easily to feel and bring down the legs; then he may push up and pull down, as we have described above. But if the head and shoulders still continue to hinder the breech and body from coming along, and the feet cannot be brought so low as the outside of the os externum, while they are yet in the vagina he may apply a noose upon one or both; for, unless the child is so small that he can turn it round by grasping the body when the head and shoulders are pushed up, and he endeavours to bring down the other parts, they will again return to the same place, and retard delivery; whereas, if he gains a firm hold of the feet, either without the os externum or in the vagina, by means of the noose fixed upon the ankles, he can with the other hand push up the head and shoulders, and be able in that manner to bring down the breech. He must continue this method of pushing up and pulling down, until the head and shoulders are raised to the fundus uteri: for, should he leave off too soon, and withdraw his hand, although the child is extracted as far as the breech, the head is sometimes so pressed down and engaged with the body in the passage, that it cannot be brought further

down without being tore along with the crotchet; for the breech and part of the body may block up the passage in such a manner, as that the hand cannot be introduced to raise the head.

[Difficulty in getting the child to evolve after the leg has been brought down, is sometimes met with, though little noticed by systematic writers. It may arise, as our author points out, from the head being jammed against the ilium. Besides the measures recommended in the text, further assistance will be derived from external manipulation of the fœtus, after the manner so well described by Braxton Hicks. This untoward occurrence has happened in my own hands, and obliged me to resort to craniotomy, before I could effect the delivery. It has been particularly noticed also by Roberton and by Madame Lachapelle, who says it is most likely to take place under a head presentation and where one leg only has been brought down—in both of which remarks I entirely concur.

In the possession of chloroform, and with a knowledge of the bimanual method of operating, we have very great advantages over Smellie. The utility of chloroform in the difficult cases of turning is perhaps more striking than in any other class of cases; but then it must be given to the fullest extent, so as to induce deep narcosis.]

In all cases, where the accoucheur foresees that great force will be requisite, he ought to save his strength as much as possible, beginning slowly, and resting his hand between whiles during the operation of pushing up and turning the child in the uterus; for if he begins to work in a hurry, and exerts his utmost strength at first, his hands will be so cramped and enervated, that he will be obliged to desist, and give them some respite; so that it may be a long time before he recovers the use of them, and even then they will be so much weakened as to be scarce able to effect delivery, which is thus impeded and delayed.

Those cases are commonly the easiest in which the fore parts present, and the child lies in a round or oval form, across the uterus, or diagonally, when the head or breech is

above and over the os pubis, with the legs, arms, and navel-string, or one or all of them, at the upper or lower part of the vagina, or on the outside of the os externum. Those are more difficult in which, though the child lies in the same round or contracted form, the back, shoulders, belly, or breast, are over the os internum; because, if we cannot move the child round, so as to place the head to the fundus, the legs are brought down with much more difficulty than in the other case; but if the shoulder, breast, neck, ear, face, or crown of the head presents, and the legs and breech are up to the fundus uteri, the case is still more difficult; because, in the other two, the uterus is contracted in a round form, so that the wrong position of the child is more easily altered than in this, when the womb is contracted in a long shape, and sometimes requires vast force to stretch it so as that the head may be raised to the fundus, and the legs and breech brought down.

The crown of the head is the worst part that can present, because in that case the feet and breech are higher, and the uterus of a longer form than in any other. The presentation of the face is, next to this, attended with the greatest difficulty; but when the neck, shoulder, back, or breast, present, the head is turned upwards, and keeps the lower part of the womb distended; so that, upon stretching the upper part, the child's head is more easily raised to the fundus.

[Smellie's advice as to husbanding our strength and proceeding with the utmost deliberation when about to perform version in any case of difficulty, is the fruit of great experience and matured wisdom. No case more embarrassing can fall to a man's lot at the outset of practice, or before he has acquired judgment and coolness. We cannot wonder, then, that terrible disasters have sometimes happened under these circumstances—the uterus or vagina torn, the omentum or intestines pulled down, and the woman's life destroyed; and as a consequence, a criminal prosecution brought against the unfortunate operator. If convicted, his judicial punishment may indeed

be light, but his reputation and prospects are for ever blasted. In the performance of the operation we should never forget the admirable maxim *arte non vi*, and that the force we may be obliged to use must be skilfully and prudently directed. Smellie speaks of the back, of the belly, and of the chest presenting at the os internum, and his 33rd table is designed to illustrate the first of these; moreover, he records a case (No. 358) where he found the back presenting, and one (No. 359) where he found the belly and funis at the os; but it is important to observe that both these patients had been under the care of midwives before he was called in. I am sure he faithfully describes what he observed; but I have grave doubt that these cases originally presented in the manner he found when brought to see them. Of presentation of the chest he gives no example. My own experience does not supply an instance of any of these rare presentations, except with premature or putrid children, where the presentation was of little or no consequence in regard to the mechanism of its birth.]

Numb. 1.—*Hands and Feet presenting.*

When the fore parts of the child present, if the feet, hands, and navel-string are not detained above the os uteri, some or all of them descend into the vagina, or appear on the outside of the os externum. If one or more of them come down, and the child at the same time lies in a round form across the uterus, let the accoucheur introduce his hand between them and the sacrum, as directed in sect. 3. When it is past the os internum, let it rest a little, while he feels with his fingers the position of the fœtus; if the head and shoulders lie higher than the breech, he must take hold of the legs and bring them down outside the os internum; if the breech is detained above the brim of the pelvis, let him slide up the flat of his hand along the buttocks, and pull down the legs with the other hand; by which method the breech is disengaged and forced into the middle of the pelvis. See Tab. XXXI.

In most of those cases where the child is pressed in an

oval form, if neither the head nor breech present, the head is to one side of the uterus, and the breech to the other; because, as was formerly observed, it is wider from side to side, than from the back to the fore part; and if either the head or breech is over the os pubis, the other is turned off to the side; in moving the head or shoulders to the fundus, they are raised with greater ease along the sides than at the back or fore parts, for the same reasons.

If the head and shoulders lie lower down, so as to hinder the breech from coming along, and the legs from being extracted, let him push up the head and shoulders to the fundus, and pull out the legs; then try, as above directed, to bring in the breech; and if it still sticks above, because the head and shoulders are again forced down by the contraction of the uterus, he must with one hand take hold of the legs that are now without the os externum, and, sliding the other into the uterus, push the head and shoulders again up to the fundus, while at the same time he pulls the legs and breech along with the feet. If the legs cannot be brought farther down than the vagina, because the breech is high up, let him slip a noose over the feet round the ankles, as before observed; by which he may pull down the lower parts with one hand, while the other is employed in pushing it up, as before. By this double purchase the child may be turned even in the most difficult cases; but the operator, in pulling, must beware of overstraining the ligaments of the joints.

If the legs can be extracted through the os externum, let a single cloth, warmed, be wrapped round them, in order to yield a firmer hold to the accoucheur; but when they can be brought no lower than the neck of the uterus and vagina, he may use one of these following nooses.

Let him take a strong limber fillet or soft garter, half worn, about one yard and a half in length, and moderately broad and thick; if thick, an eye may be made at one end

of it, by doubling about two inches and sewing it, strongly, and the other end passed through this doubling in order to make the noose, which being mounted upon the thumb and fingers of his hand must be introduced and gently slipped over the toes and feet of the child so as to embrace the ankles, and thus applied it must be drawn tight with his other hand.

If the foot or feet should be so slippery that his fingers cannot hold them and work over the noose at the same time, it must be withdrawn and mounted round his hand or wrist; with which hand when introduced he may take firm hold on both feet, if they are as far down as the vagina; then with the fingers of his other hand he can slide the noose along the hand and fingers that hold the feet, and fix it round the ankle. But if one foot remains within the uterus, the fingers of his other hand cannot push up the noose far enough to slide it over the ankle; so that he must have recourse to a director like that for polypuses, mounted with the noose, which will push it along the hand and fingers that hold the foot. The noose being thus slipped over the fingers upon the ankle, he must pull the extremity of the fillet, which hath passed the eye at the upper end of the director; and after it is close drawn, bring down the instrument.

Some use a small slender pair of forceps to grasp the ankles and slide the noose along them; others make use of a fillet with a noose upon one end of it, fixed on a hollow tube that carries it up to be slipt over the ankles; and this being done, it is drawn close by pulling the other end of the fillet down through the cavity of the tube; but there is seldom occasion for any of these instruments, because we can for the most part bring the feet down into the vagina.

If the fillet or garter is too narrow or thin, let it be doubled in the middle, and the noose made by passing the two ends through the doubling.

[The cases here considered may be included under the head of "complex presentation," and the recorded examples are Nos. 346, 347, and 348. Mr. Roberton's term for such cases is "odd presentations." The head, as well as the hand, foot, and funis, may lie within the reach of the examining finger at the os uteri. Many examples of complex presentation are related by authors, especially by La Motte (Cases 286, 287, and 288), and Roberton (*op. cit.*, p. 451); and I have met with a few myself. They are generally best treated by drawing down the leg and delivering as a half breech; but before doing this we should make sure that the head belongs to the same fœtus as the leg; for if it be that of another fœtus, a very serious complication would arise from bringing down the leg, as I shall show when speaking of twins. Having determined on doing this, there is really nothing peculiar in the mode of delivery; the extraction of the fœtus is to be conducted in the same manner as on ordinary occasions, unless the presence of the funis should necessitate haste; so that the directions here given by our author would seem to be little more than a repetition of what he has already laid down.

Another and opposite state of things is sometimes met with, namely, the absence of any presentation even after the os uteri is well dilated. To a young practitioner these cases of "non-presentation" are rather perplexing, and they always necessitate caution in regard to diagnosis and prognosis, and close observation of the patient till we know what the presentation will prove to be. Smellie was well acquainted with this anomaly, and under Case 325 makes some observations upon it.]

Numb. 2.—*Abnormal Presentations requiring Turning.*

When the belly presents, and the head, shoulders, breech, thighs, and legs, are turned up over the back to the fundus uteri; when the back presents, and all these parts are upwards; when the side presents with the head, shoulders, breech, thighs, and legs turned to the side, back, or fore part of the uterus; in all these cases, when the child is pressed into a round or (more properly) an oval figure, it may be for the most part moved round, with one hand

introduced into the uterus, the head and shoulders pushed to the fundus, and the legs and breech to the os internum; which being effected, the legs are easily brought down. (See Tab. XXXII, XXXIII.) But these cases are more or less difficult as the feet are farther up or lower down, because the business is to bring them downwards.

When the breast, shoulders, neck, ear, or face presents to the os internum, the breech, thighs, and legs being towards the fundus, with the fore parts of the fœtus turned either to the side, back, or fore part of the woman's belly, and the whole lying in a longish form, the uterus being closely contracted around its body like a sheath (see Tab. XXXIV); let the accoucheur introduce his hand into the vagina, and open the os internum, by pushing up the fingers and hand flattened between the parts that present and the inside of the membranes; and rest his hand in that situation, until he can distinguish how the child lies, and form a right judgment how to turn and deliver; for if these circumstances are not maturely considered, he will begin to work in a confused manner, fatigue himself and the patient, and find great difficulty in turning and extracting the child.

[I have already expressed a strong conviction—based on a very extended experience—that the back or the belly never forms the original presentation of a mature fœtus; and that a living fœtus could present "with its head, shoulders, breech, thigh, and leg turned up over the back to the fundus uteri," is to my mind a physiological impossibility. Smellie's distinctions about the fœtus being in an "an oval figure," or "lying in a longish form," are of little importance as affecting our practice. His intimate acquaintance with preternatural cases, even of rare description, led him to make distinctions, which perhaps are only refinements, and devoid of real clinical utility. He very properly urges the importance of endeavouring to make out the exact position of the child in utero before following up the operation. This sound advice is quite consistent with his teaching on all other occasions. An accurate knowledge of

the position of the fœtus is an essential element of rational treatment under all circumstances, although I am free to admit that success is possible without it.]

If the feet and legs of the fœtus lie towards the back, sides, or fundus uteri, the woman ought to be laid on her back, with her breech raised and brought a little over the bed, as formerly observed; because in that position he can more easily reach the feet than in any other.

If they lie towards the fore part of the uterus, especially when the belly is pendulous, she ought to lie upon her side; because in the other posture it is often difficult to turn the hand up to the fore part of the womb: whereas, if she is laid on the left side, the right hand may be introduced at the upper part and left side of the brim of the pelvis, where it is widest, and then along the fore part of the uterus; by which means the feet are more easily come at. If it is more convenient for the accoucheur to use his left hand, the patient may be turned on her right side. The only inconvenience attending these positions, is, that the woman cannot be kept so firm and steady, but will be apt to toss about and shrink from the operator; and, besides, there may be a necessity for turning her upon her back, after the body is delivered, before he can extract the head, especially if it be large, or the pelvis narrow.

The situation of the child being known, and the position of the mother adjusted, let the proper hand be introduced, and the first effort always made in pushing the presenting part up towards the fundus, either along the sides, back, or fore part of the uterus, as is most convenient. If this endeavour succeeds, and the breech, thighs, or legs come down, the body may be delivered with ease; but if the head, shoulder, breast or neck, present, the other parts of the body being stretched up lengthwise, and the uterus so strongly contracted around the child that the presenting part cannot be raised up, or,

though pushed upwards, immediately returns before the legs can be properly seized or brought down; the operator ought, in that case, to force up his hand slowly and gradually between the uterus and the child. If the resistance is great, let him rest a little between whiles, in order to save the strength of his hand and arm, as formerly directed; and then proceed with his efforts until he shall advance his hand as far as the feet; for the higher his hand is pushed, the more will the uterus be stretched, and the more room granted for bringing the legs along; and if, in pushing up his hand, the fingers should be entangled in the navel-string or one of the arms, let him bring it a little lower, and pass it up again on the outside of such encumbrance.

The hand being advanced as high as the fundus, let him, after some pause, feel for the breech, and slide his fingers along the thighs in search of the legs and feet; of which taking hold with his whole hand, if possible, let him bring them down either in a straight line or with an half turn; or should the contraction of the uterus be so strong that he cannot take hold of them in that manner, let him seize one or both ankles between his fingers, and pull them along; but if he cannot bring them down to the lower part of the uterus, so as to apply the noose, he must try again to push up the body, in order still more to stretch the uterus, and obtain a freer scope to bring them down lower; then he may apply the noose, and turn the child as above directed, until the head and shoulders are raised up to the fundus, and the feet and breech delivered.

If one leg can be brought down, the child being turned, and that member extracted through the os externum, let the accoucheur slide his hand up to fetch the other; but if this cannot be done, he must fix a finger on the outside of the groin of that thigh which is folded up along the belly, and bring along that buttock, as in the breech case,

while he pulls with his other hand at the other leg; and, the body being thus advanced, deliver as before directed.

[Pugh advises that the left hand should always be the one employed, both in turning and in extracting the placenta; as, with the patient lying on her left side, the right hand passed up between her thighs can be of great service by external pressure on the uterus (*op. cit.*, p. 9). Mr. Roberton's rule was to use "that hand which corresponds to the side of the body on which the patient is lying," because with it only can he operate, and at the same time maintain a regard to the axis of the passage. It is difficult to overrate the importance of this, as long experience has convinced me." (*op. cit.*, p. 329). For several years I have acted on the rule laid down by Pugh, and never have had reason to regret doing so. Dr. Radford, many years ago, pointed out that the chance of saving the child is somewhat greater by delivering it as a half breech; and Sir J. Simpson showed that the leg on the opposite side to the presenting arm is the one which should be brought down, as by so doing, the evolution of the child *in utero* is effected more completely and with less difficulty, than if the leg on the same side as presenting arm were laid hold of. I am satisfied his reasoning is correct, and that the precept based upon it should always be followed when practicable.

If the knee be reached before the foot it will answer equally well to seize and turn with it. In every case of difficulty we shall find benefit from following Mr. Roberton's example and "stuffing the vagina with lard" before proceeding to operate; this is better than "injecting about a pint of sweet oyl into the womb with an uterine syringe," as Pugh directs (*op. cit.*, p. 57).]

When the shoulder presents, and the arm lies double in the vagina, let him push them both up; but, if this cannot be done, and the hand is prevented from passing along, he must bring down the arm, and hold it with one hand, while the other is introduced; then let go and push up the shoulder, and as the child is turned, and the feet brought down, the arm will for the most part return into the uterus; but, if the arm that is come down be so much swelled, that it is impracticable to introduce the hand so

as to turn and deliver the child, he must separate it at the joint of the shoulder, if it be so low down; or at the elbow, if he cannot reach the shoulder. If the limb be much mortified, it may be twisted off; otherwise it may be snipt and separated with the scissors.

If the shoulder, by the imprudence and ignorance of the unskilful, who pull in expectation of delivering in that way, is forced into the vagina, and part of it appears on the outside of the os externum, a vast force is required to return it into the uterus; because in this case the shoulder, part of the ribs, breast, and side, are already pulled out of the uterus, which must be extended so as not only to receive them again, but also the hand and arm of the accoucheur. If this distension cannot possibly be effected, he must fix a crotchet above the sternum, and turn the child by pushing up the shoulder and pulling down with the crotchet; or slide his fingers to the neck of the child, and with the scissors divide the head from the body; then deliver first the separated head, or bring along the body by pulling at the arm, or, if need be, with the assistance of the crotchet; after the body is delivered, the head must be extracted according to the rules that will be laid down in sect. 5 (page 345).

[In performing evisceration, I have generally aimed at fixing the crotchet or blunt hook, not on the thorax, but on the inside of the fœtal pelvis, and this done we can generally effect the evolution of its body necessary for delivery. A dread of the difficulty of getting away the detached head has generally operated in deterring practitioners from employing decapitation; but this apprehension is nearly groundless if we have a cephalotribe at hand. Again, the imperfection of the means of severing the head was a great barrier to the adoption of this alternative measure. This operation of detruncation has of late years been revived (for it is really older than evisceration), and many of the highest modern authorities, viz., Tarnier, Scanzoni, Pajot, Davis, Simpson, Ramsbotham, Barnes, and Kidd, all advocate the operation in the strongest terms. For dividing the neck, scalpels,

decapitating hooks, and scissors, have been used, but perhaps the simplest and safest mode of accomplishing it is that practised by Dr. Kidd (of Dublin), and which is the same, in essential points, as the plan recommended by Heyerdahl and Pajot, and consists in sawing through the neck with a hard well-twisted cord. This cord passed through an elastic catheter, mounted on a firm stilette, properly curved, is carried round the neck when the cord is seized and retained *in situ* whilst the catheter and stilette are removed. The two ends of the cord are now brought through a speculum to prevent the vagina from being frayed, when the cord is drawn rapidly backwards and forwards to effect the division, which is generally accomplished in five minutes. It has been suggested, and with good reason, that the écraseur might advantageously take the place of the cord for dividing the neck. The breaking of the cord is to be guarded against by frequently bringing a fresh portion into action. The cases best suited for decapitation are those in which the body of the child cannot be turned although the leg has been brought down. "Certainly," writes Dr. Kidd, "when I contrast the safety, ease, and rapidity with which the operation was performed, with the difficulty I have myself experienced, and seen occur with several experienced operators in performing evisceration, I am most favourably impressed with the value of the operation of decapitation." ('Dub. Quar. Med. Jour.,' May, 1871.) If the foot be in the vagina, we are advised by Dr. Kidd to discontinue the use of the hemp saw, (as we may call it,) as soon as the spinal column is divided, and to leave the head attached to the trunk by the uncut portions of the soft tissues, as these will assist us in extracting the head after the body has been delivered.

Smellie does not appear to have met with any instance of spontaneous version of the child; had he done so, it would, without doubt, have arrested the attention of so keen an observer of nature, and have been put on record among his clinical histories. I think that Case 361 would have terminated, had he not interposed, in the expulsion of the fœtus according to the manner described with such accuracy and minuteness by the late Dr. John C. Douglas, of Dublin. This variety of spontaneous version I have several times witnessed, and on one occasion the child—a triplet at the full term of pregnancy—was born alive, and survived its birth for some months. The occurrence of that variety of spontaneous version or evolution, described by Denman, has never come under my observa-

tion or knowledge, and must be of extreme infrequeney. It is of importanee for praetitioners to be aware what are the eireumstances under whieh we may caleulate upon nature's effeeting the delivery in a transverse presentation. If, then, the ehild be very small, putrid, or premature, we may presume that spontaneous version is probable; but if in addition to this, as Douglas points out, "the arm of the fœtus should be almost entirely protruded, with the shoulder pressing on the perineum; if a eonsiderable portion of its thorax be in the hollow of the saerum, with the axilla low in the pelvis; if, with this disposition, the uterine efforts be still powerful, and if the thorax be forced sensibly lower during the pressure of each sueeessive pain, the evolution may with great eonfidence be expected" ('An Explanation,' &e., 3rd edit., p. 37).]

When the forehead, face, or ear presents, and eannot be altered with the hand into the natural position; or is not advaneed to the os externum, so that we ean assist with the foreeps; the head must be returned, and the ehild delivered by the feet; but if this eannot be done, and the woman is in imminent danger, reeourse must be had to the crotchet.

Numb. 3.—*Prolapse of the Cord.*

If the navel-string eomes down by the ehild's head, and the pulsation is felt in the arteries, there is a neeessity for turning without loss of time; for, unless the head advanees fast and the delivery is quiek, the eireulation in the vessels will be entirely obstrueted, and the ehild eonsequently perish. If the head is low in the pelvis, the foreeps may be sueeessfully used.

No doubt, if the pelvis is very narrow, or the head too large, it would be wrong to turn; in that ease, we ought to try if we ean possibly raise the head, so as to reduee the funis above it, and after that let the labour go on. But if the waters are all gone, and a large portion of the funis falls down, it is impossible to raise it, so as to keep it up,

even although we could easily raise the head; because as one part of the funis is pushed up with the fingers, another part falls down, and evades the reduction; and to raise it up to the side, and not above the head, will be to no purpose; when a little jets down at the side of the head, our endeavours will for the most part be successful.

[Besides turning, and forceps delivery, modern ingenuity has devised the postural treatment, and the plan of carrying up the loop of funis and lodging it above the presenting head. Both these appear facile and effective on paper, but in practice are not found to be so very successful. Simple reposition of the cord by the fingers or catheter, the patient being in the genu-pectoral position, often succeeds; but I believe that, of all the modes of treatment recommended, the most successful, as regards the child, is turning. Thus, of *sixty-four* cases (in the practice of La Motte, Mauriceau, La Chapelle, Boivin, Shekleton, Giffard, and M'Clintock), where turning was resorted to *solely* on account of the funis presenting, *fifty-two* of the children were born alive. This list does not include cases where the hand or arm presented with the cord, nor those in which the child was apparently dead when the operation was undertaken. No other plan of treatment can show such good results as this. From his remarks on Case 370, it appears that Smellie had a very favourable opinion of turning in the class of cases we are now considering. Besides the case just alluded to four others are given, where the cord prolapsed; their numbers are, 331, 346, 348, and 397. Pugh's advice is brief and decisive: "As soon as you perceive the navel-string presents, think of no method but that of turning and extracting the child by the feet; and then you run no risque of destroying the child, for, should the pelvis be ever so good, your operations will be easier and sooner over, and if a bad one it is what you must do at last" (*op. cit.*, p. 111).]

Numb. 4.—*Cephalic and Podalic version.*

The ancients, as well as some of the moderns, advise, in all cases when the upper parts, such as the shoulders, breast, neck, face, or ear of the child, present, to push them upwards, and bring in the head as in the natural way;

observing, that the fœtus ought never to be delivered by the feet, except in the presentation of the lower parts, such as the small of the back, belly, side, breech, or legs. Were it practicable at all times to bring the head into the right position, a great deal of fatigue would be saved to the operator, much pain to the woman, and imminent danger to the child; he therefore ought to attempt this method, and may succeed when he is called before the membranes are broken, and feels, by the touch, that the face, ear, or any of the upper parts presents. In that case, let him open the os externum slowly during every pain: and when the os internum is sufficiently dilated by the descent of the waters and membranes, let him introduce his hand into the uterus, as directed in sect. 3, betwixt the womb and the membranes, which must be broke; and if he finds the head so large, or the pelvis so narrow, that it will be difficult to save the child, provided the woman is vigorous and has strong pains, he may with little difficulty bring in the crown of the head, then withdraw his hand; and, if the pains return and continue, the child has a good chance to be delivered alive. See chap. ii, sect. 3, no. 3). Even after the membranes are broke, if the presenting part hath so locked up the os internum as to detain some portions of the waters (a circumstance easily known in pushing up the part that presents), he may easily run up his hand speedily to keep them from being discharged, and act in the same manner; but if child is not large, nor the pelvis narrow, it were pity, while his hand is in the uterus, to desist from turning the child and bringing it by the feet; because in that case we may be pretty certain of saving it. Besides, after the head is brought into the right position, should the pains go off entirely (and this frequently happens), or a flooding comes on, in consequence of the force which hath been exerted, he will find great difficulty in turning after the waters have been discharged; for it is harder to

turn when the vertex presents than in any other position; whereas, in the case of a large head or narrow pelvis, when the head is forced down by the labour-pains, and will not farther advance, the child may be saved by the forceps; nay, though the pains do not act so as to force it down to be delivered either by the forceps or in the natural way, the head may be opened and extracted with the crotchet, which is the last resource.

But this necessity seldom occurs, because the cases in which we are most commonly called are after the membranes have been long broken, the waters discharged, and the uterus strongly contracted around the body of the child, which it confines, as it were, in a mould; so that I have frequently tried in vain to bring the head into the natural position; for this cannot be effected without first pushing up the part that presents, for which purpose great force is required, and as one hand only can be introduced, when the operator endeavours to bring in the head, the pushing force is abated, to allow the pulling force to act; and the parts that hindered the head from presenting are again forced down; besides, the head is so large and slippery, that he can obtain no firm hold. He might, indeed, by introducing a finger into the mouth, lay hold of the under jaw, and bring in the face, provided the shoulder presents; but instead of amending, this would make the case worse, unless the child be very small; yet, granting the head could be brought into the natural position, the force necessarily exerted for this purpose would produce a flooding, which commonly weakens the patient and carries off the pains; and after all, he must turn with less advantage; and if that cannot be performed when the head is brought in, he must have recourse to the last and most disagreeable method; whereas, when any other part presents, we can always turn the child, and deliver it by the feet. This we cannot promise after the head is brought

in ; and once the operator's hand is in the uterus, he ought not to run such risks.

When I first began to practise, I frequently endeavoured to adjust the position of the head in this manner ; but meeting with those insuperable difficulties I have mentioned, I adhered to that method which I have always found certain and safe. I have likewise used the *impellens* of Albucasis, in order to keep up the shoulders or body until I could bring in the head ; but the contraction was always so great that the instrument slipt, and was in danger of hurting the uterus. Indeed, when the ear, forehead, or the fontanel, presented, I have, by pushing up, found the head come into the right position ; I have likewise, when the forehead was towards the groin or side of the pelvis, moved it more backwards, by which means the forceps were fixed with more ease ; but I have much oftener failed, by the head's returning to its former situation.

The child is often in danger, and sometimes lost, when the breech presents and is low down in the pelvis, provided the thighs are so strongly pressed against the funis and belly as to stop the circulation in the rope ; as also when the child is detained by the head after the body is delivered : in both cases the danger must be obviated by an expeditious delivery ; and if the body is entangled in the navel-string, it must be disengaged as well as possible, especially when the funis happens to be between the thighs. As I have before observed, many of these minute directions, in laborious and preternatural cases, may be thought idle and trifling by those practitioners who, without minding any stated rules, introduce the forceps, and taking hold on the head at random deliver with force and violence ; and who, in preternatural deliveries, thrust up their hands into the uterus, and, without considering the position, search for the feet, pull them down and deliver in a hurry. Such practice may sometimes succeed ; but will

often destroy the child, and bruise and injure the parts of the mother, even to the hazard of her life. See Collect. XXXIV.

[To allow of respiration going on whilst the fœtal head is still in the pelvis Pugh recommended the use of a curved tube, which was introduced into the child's mouth, and a similar expedient has been suggested by some modern accoucheurs. One of these—Weidmann—describes this pipe or tube under the high-sounding name of *vectis aerophorus*. Pugh, at a later period of his practice, relinquished the tube, and trusted to two fingers in the mouth, whereby air could have acccss.

The objections urged by our author against cephalic version are valid and weighty, and enough to deter most practitioncrs from attempting the operation. Smellie deliberately put in practicc, on a very few occasions, however, the restoration of a lost vertex position. One was a face presentation, another was a hand presentation, and in the third the breast presented.

The concluding observations of this section very well describe a stylc of practice too often followed, in which a regard for any clear method or definite principle of action is lost sight of. All Smellie's teaching and doctrines were opposed to this kind of obstetric empiricism. As he himself tclls us in Case 186, he "endeavourcd to reduce the art of midwifery to the principles of mechanism," and he "diligently attended to the course and operations of nature which occurred in his practice, regulating and improving himself by that infallible standard." Perhaps there is no other accoucheur who so fully and so consistently acted up to the principles he professed to hold as did Smellie.]

Sect. 5.—Numb. 1.—*Extraction of the after-coming Head.*

The legs and breech of the child being brought down, and the body properly turned with the fore-parts to the mother's back, let the accoucheur endeavour to bring it along; but if it is detained by the size of the belly, distended with air or water (a case that frequently happens when the child has been dead for several days), let the

belly be opened, by forcing into it the points of his scissors; or he may tear it open with the sharp crotchet.

The body of the child being delivered, the arms brought down, and every method hitherto directed unsuccessfully used for the extraction of the head, which is detained by being naturally too large, over-ossified, or dropsical, or from narrowness and distortion of the pelvis; if the belly was not opened, and the child is found to be alive by the motion of the heart, or pulsation of the arteries in the funis, the forceps ought to be tried (see Tab. XXXV); but if he finds it impracticable to deliver the head so as to save the life of the child, he must, according to some, force the points of the scissors through the lower part of the occipital bone, or through the foramen magnum; then dilate the blades so as to enlarge the opening, and introduce a blunt or sharp hook. This operation rarely succeeds when the head is over-ossified; but may answer the purpose when the bones are soft and yielding, or in the case of an hydrocephalus; because in the first the aperture may sometimes be enlarged, and in the other the water will be evacuated so as to diminish the bulk of the head, which will of consequence come along with more ease.

Some recommend an instrument to perforate the skull, with double points curved and joined together; which, when pushed into the foramen, are separated, and take hold on the inside; but as the opening with the scissors and introducing the blunt hook as above, will answer the same end, it is needless to multiply instruments, especially as this method is not so certain as the following.

If, notwithstanding these endeavours, the head cannot be extracted, let the operator introduce his hand along the head, and his fingers through the os uteri; then slide up one of the curved crotchets along the ear, betwixt his hand and the child's head, upon the upper part of which it must be fixed; this being done let him withdraw his hand,

take hold of the instrument with one hand, turning the curve of it over the forehead, and with the other grasp the neck and shoulders, then pull along. The crotchet being thus fixed on the upper part, where the bones are thin and yielding, makes a large opening, through which the contents of the skull are emptied; the head collapsing is with more certainty extracted, and the instrument hath a firm hold to the last, at the forehead, os petrosum, and basis of the skull.

In introducing the crotchet, let the operator remember the caution given in chap. iii, sect. 5. He must not begin to pull until he is certain that the point of the instrument is properly fixed near the vertex; and he must keep the handle back to the perineum.

The excellency of Mesnard's contrivance is more conspicuous here than when the head presents: because the curvature of the crotchet allows the point to be fixed on the upper part of the skull, which is to be tore open; and in pulling, the contents are evacuated, and the head is lessened. By these means the principal obstruction is removed; whereas the straight crotchets take so slight a hold, and slip so often, that several times I have been very much fatigued before I could effect the delivery; but have always succeeded to my satisfaction since I adopted the other kind. See Collect. XXXV and Tab. XXXIX.

If one crotchet be found insufficient, let him introduce the other in the same manner along the opposite side, lock and join them together, and pull along, moving and turning the head so as to humour the shape of the pelvis. This method seldom fails to accomplish his aim, though sometimes very great force is required; in which case he must pull with leisure and caution.

[Who first made trial of the forceps in these cases of difficult extraction of the after-coming head, I cannot positively say; but if not the originator of the practice, Smellie was cer-

tainly one of the first to resort to it. In Cases 315, 350, and 381, he tried his short forceps to remove the after-coming head, detained at the brim. The last of these cases occurred in 1746; in each of them he failed, and it was this failure (as he says in Case 315) which prompted him to contrive a longer instrument with the pelvic curve; and such an instrument he successfully used on three or more occasions to extricate an after-coming head (*vide* Cases 347 and 352). In the preface to his first series of cases he says, speaking of his long double-curved forceps, "Of late I have found them very serviceable in helping along the child's head in preternatural cases, after the body and arms of the fœtus were brought down, and it could not be delivered without destroying the child by overstraining the neck and jaw. On such occasions they are more convenient than the short and straight sort, because they take a firmer hold." Some authors, especially the late Professor Meigs, speak strongly in favour of this application of the instrument. I myself have never deemed it requisite to employ it in these cases, and if the head be in the cavity there cannot possibly be a necessity for its use. Pugh advised strong supra-pubic pressure to be made on the head simultaneously with traction on the neck, and by this method he says he has "never once failed of success, and without the least injury to the patient" (op. cit., p. 53). I don't know of any one who has carried out this plan so vigorously as Dr. Goodell, of Philadelphia. In his memoir on turning, &c., already quoted, he states that the *vis à tergo* or propulsion exercised upon the head by the supra-pubic pressure of the hands is nearly equal to the *vis à fronte* or extractive force exerted on the body of the child, and that in one of his cases the combined force thus brought to bear on the child was "certainly not less than 200 lb."

If a resort to craniotomy becomes necessary in order to deliver the head, the perforator may be passed up through the roof of the mouth, or behind and a little above the ear, when the curve at the extremity of the perforator will be found of some use.]

Numb. 2.—*Extraction of detached Head.*

But if all the expedients should fail, by reason of the extraordinary ossification or size of the head, or the narrowness and distortion of the pelvis, after having used the

crotchet without success, he must separate the body from the head with a bistoury or pair of seissors; then, pushing up the head into the uterus, turn the face to the fundus, and the vertex down to the os internum and brim of the pelvis; let him direct an assistant to press upon the woman's belly with both hands, in order to keep the uterus and head firm in that position; then open the skull with the scissors, destroy the structure of the brain, and extract with the crotchets, as directed in chap. iii, sect. 5, (page 299.)

[Smellie here supposes a case where perforation of the skull cannot be accomplished; but such a case I have never met, nor does Smellie give any example of it from his own practice. The propriety of the advice is more than questionable. I would consider it very objectionable, as detruncation under these circumstances would assuredly add a serious difficulty to that already existing, and without any compensating advantage. I am at a loss how to reconcile the advice in the text with that clearly expressed elsewhere. For example, in Case 391, he says: "I exerted more and more force *till I found the neck giving way,* and it was impossible to save the child. I was then obliged to introduce the curved crotchet," &c. &c., with which he completed the delivery. Again, in Case 405, where a midwife had pulled the body away, he tells us that, "to his great joy," he found the head lying in the vagina, and not above the brim. Lastly, in Case 408, he pronounces a very decided opinion on the point in question. Here two practitioners failing to extract the head, had detached the body by dividing the neck. Smellie had very much trouble, though assisted by Dr. Hunter, in getting the head away, and in his remarks upon this case he thus expresses himself: "This should be a caution to practitioners never to separate the body from the head, if possible to deliver without using that expedient . . . . for the head is much easier delivered with the crotchet when not separated from the body."]

The head is sometimes left in the uterus by those practitioners who, not knowing how to turn the fore parts and face of the child towards the back part of the uterus, or how to bring it along although it presented in that position, pull at random with all their strength, so that the

neek is stretched and separated, and the head left behind. This may also happen to an expert accoucheur, when the child hath been dead for many days, and the body is much mortified, even though he hath used all the neeessary precautions.

[This accident once occurred in my own hands. The fœtus was premature, and far advanced in decomposition. Immediately on the spine giving way I discontinued extracting, whereby some of the integument of the neek remained, connecting the head and the body. This was a great help to me in getting the crotchet fixed in the orbit, which done, the head was removed without very much trouble.]

In such a ease, provided the head is not very large, nor the pelvis narrow, and the forehead is towards the saerum, let him slide up his hand along the baek part of the pelvis, and, introdueing two fingers into the mouth with the thumb below the chin, try to pull the forehead into the hollow of the sacrum; if it stieks at the jetting-in of that bone, he must endeavour to move it first to one side and then to the other. If the head is small it will come along; if any fragment of the neck remains, or any part of the loose skin, he may lay hold on it, and assist delivery by pulling at it with his other hand; if the head is low down, it may be extraeted with the forceps.

Should all these methods fail, let him push up his hand along the side of the head, until it shall have passed the os internum; with the other hand let him introduee one of the curved erotchets, and fix it upon the upper part of the head; then withdrawing the hand which was introdueed, take hold on the instrument, and sliding the fingers of the other hand into the mouth, he must pull down with both, as above directed. If the head is not over-ossified, the crotchet will tear open the skull; and the bulk being of consequence diminished, the whole may be brought along, even in a narrow pelvis; but if it cannot be moved even

by this expedient, he must introduce the other crotchet along the other side of the head, and fixing it upon the skull, lock them together; then, in pulling, turn the forehead down into the hollow of the sacrum, and extract with a half-round turn upwards, as when delivering with the forceps.

If the forehead is towards the os pubis, and cannot be brought into the right position, let him with his hand push up the head into the uterus, turn the forehead from the anterior to the side or back part of it, and try to extract as before. If the child hath been dead some time, and is much mortified, he must pull cautiously at the under jaw, because, should that give way, he will have no other hold for pulling or keeping the head steady, when he attempts to extract with one crotchet.

When the head is so large, or the pelvis so narrow, that none of these methods will succeed, let him push up, and, turning the upper parts downwards, direct an assistant to press the patient's belly with both hands, moving them from side to side, and squeezing in such a direction, as will force the head towards the os internum, and retain it firmly in that position; then it must be opened and extracted, according to the directions given in chap. iii, sect. 7, numb. 2, (page 299.)

Although by these methods I have succeeded in a few cases of this kind which have happened in my practice; yet, as great difficulties may occur from inflammations of the pudenda, contraction of the uterus, slipperiness or largeness of the head, and the narrowness of the pelvis, it will not be improper to inform the reader of other methods that appear to me useful, particularly when the parts are much contracted and swelled. Let the hand be introduced into the vagina, and if it cannot be admitted within the uterus, the fingers being insinuated, may move the head so as to raise the face and chin to the fundus, the vertex being

turned to the os internum, and the forehead towards the side of the sacrum. This being effected, let the operator slide up along one ear a blade of the long forceps, which are curved to the side (see Tab. XVII, XXXV); then change hands, and send up the other blade along the opposite ear; when they are locked and the handles secured by a fillet, he must pull the head as low as it will come; then putting them into the hands of an assistant, who will keep them in that position, let him make a large opening with the scissors, squeeze the head with great force, and extract slowly and by degrees.

There is an old instrument with two sides which turn on a pivot, formerly recommended in this case, and since improved, with the addition of another side, by Mr. Levret, who gives it the denomination of *tire-tête*: but as I thought the contrivance was too complex, and the blades too much confined to a circular motion, I have altered the form of it in a manner that renders it more simple, convenient, and less expensive. Having turned down the vertex as above directed, let this instrument, with the three sides joined together, be introduced along the accoucheur's hand to the upper part of the head; then let the sides or blades be opened with the other hand, so as to inclose the head, moving them circularly and lengthwise in a light and easy manner, that they may pass over the inequalities of the scalp, and avoid the resistance of the head and uterus; when they are exactly placed at equal distances from one another, let him join the handles, withdraw his hand, and, tying them together with a fillet, pull down, open, and extract, as above directed; and let it be remembered, that the farther the hand can be introduced into the uterus, the more easily will both instruments be managed.

When the pelvis is large, or the head small (in which cases this misfortune seldom happens), without doubt we might succeed with Mauriceau's broad fillet or sling, pro-

vided it could be properly applied; but, upon trial, I found my hand so much cramped by the contraction of the uterus, and was so much incommoded by the slipperiness of the head, upon which I could not fix it so as to have sufficient hold, that after many fruitless efforts I was obliged to have recourse to the scissors and crotchets as above.

Amand's net is attended with the same difficulties; and rather more troublesome, as it is more compounded; for, when it is mounted on the operator's hand, it will be found scarce practicable to bring over the head the narrow fillet by which it is pulled along, because it commonly slides off from one side or the other.

If the placenta adheres to the uterus, let him first extract the head; if the cake is separated and in his way, let him deliver it before he begins to deliver the head.

When the head is small, or the pelvis large, dilating the foramen magnum with the scissors, and introducing the blunt hook, may be of use either to pull the head along or keep it down, until we can fix the forceps, curve-crotchet, or Levret's *tire-tête*. See Collect. XXXVI.

[Separation of the body from the head with retention of latter *in utero* is happily a rare accident at the present day, exeept as the result of detruneation in transverse presentation. If the head be in the vagina no great diffieulty need be experieneed in removing it, but if, as commonly happens, it be in the uterus, then under these eireumstances its extraetion requires some judgment and a good deal of eareful manipulation.

Very little can be added to the full and explicit direetions laid down by Smellie for our guidance in this matter. In seizing the head we must bear in mind that the edges of the divided spine might lacerate the soft parts, and that, therefore, in extracting, we should keep the vertebræ above or below, so as to lessen this souree of danger. Whilst endeavouring to introduce the perforator eonsiderable aid ean be derived from supra-pubic pressure by the hands of an assistant, whilst a *vis à fronte* can be made by the erotchet or blunt hook on the lower jaw; if the head be small or the pelvis

large this latter hold, together with the external pressure and uterine contractions, may suffice to effect delivery. Barnes advises perforation, and then the use of the craniotomy forceps. In Dr. Kidd's case of decapitation he cut through the body of the last cervical vertebra, and—after the neck was severed and the body drawn out by the arm—he "seized the head with a forceps, and brought it down until he got his finger into the mouth, and delivered the head without any difficulty whatever" ('Dub. Med. Jour.,' March, 1872, p. 73). Mr. Roberton relates a case where he had to deliver a detached head, and the means he used are well described, but do not differ in any important particular from the last of the methods recommended by Smellie, that, namely, of grasping the head with the forceps, and then perforating it; but Roberton was apparently unaware of Smellie's directions, for his reason for publishing this case is that "he did not remember reading an account of the management of a case of this nature." (*op. cit.*, p. 452). In perforating through the roof of the orbit, as this last author advises, we must be careful not to push the perforator too far, else the point will pierce the calvarium (as happened once in my own hands), and might inflict injury on the uterus. Deformity of the pelvis adds very materially to the difficulty of managing these cases, and may necessitate a resort to the use of the cephalotribe.]

CHAPTER V.

OF TWINS, MONSTERS AND CÆSARIAN SECTION.

SECT. 1.—*Twins.*

Twins are supposed to be the effect of a double conception in one coition, when two or more ova are impregnated with as many animacula; which descending from the ovarium, through the Fallopian tube, into the fundus uteri, as they increase, come in contact with that part, and with one another, and are so pressed as to form one globular

figure, and stretch the womb into the same form which it assumes when distended by one ovum only; and that, during the whole term of uterine gestation, it is impossible to distinguish twins, either by the figure and magnitude of the uterus, or by the motion of the different fœtuses; for one child, when it is large and surrounded with a great quantity of waters, will sometimes produce as large a prominence (or even larger) in the woman's belly, than is commonly observed when she is big with twins. One child will also, by moving its legs, arms, and other parts of its body against different parts of the uterus, at the same instant or by intervals, yield the same sensation to the mother as may be observed in two or more children; for part of the motion in twins is employed on each other, as well as upon the uterus.

[The diagnosis of twins before the accession of labour is rarely an object of any importance, and more rarely is it attainable with certainty. Women carrying twins are more liable to suffer from the ailments incident to pregnancy, especially from œdema of the legs and labia, from gastric derangement and abdominal pains. The cause of unusual abdominal enlargement in gestation will generally be between multiple pregnancy and dropsy of the amnios, and a careful vaginal examination will often enable us to discriminate between these, for in the former case we will find no presentation, or the presenting part will be very high up and floating about, whereas, for obvious reasons, the reverse will obtain if there be twins or triplets. The presence of fœtal heart sounds at two remote parts of the abdomen is strong presumptive evidence of twins, but should not be regarded as conclusive unless their rates of frequency be different. After labour has set in and the membranes have broken we may sometimes establish the fact of twins by the coexistence of a fœtal heart *in utero*, with the presentation of a pulseless funis or putrid limb or flaccid scalp; or if, with unusual largeness of the abdomen after the escape of the waters, there be very feeble inert action of the uterus, we may reasonably suspect the presence of a twin pregnancy. There are two cases where our management of the first child should in some degree be influenced by the know-

ledge of there being a second *in utero*, viz. where we are called upon to deliver the first child by turning, and where the delivery of the first may chance to be obstructed by a part of the other fœtus intruding itself into the pelvis, of which I shall say something further on.]

There is therefore no certain method of distinguishing in these cases, until the first child is delivered, and the accoucheur has examined if the placenta is coming along. If this comes of itself, and after its extraction the mouth of the womb be felt contracted, and the operator is unwilling to give unnecessary pain by introducing his hand into the uterus, let him lay his hand upon the woman's abdomen, and if nothing is left in the womb, he will generally feel it, just above the os pubis, contracted into a firm round ball of the size of a child's head, or less; whereas, if there is another child left, the size will be found much larger. If the placenta does not come down before the second child, which is frequently the case; upon examining he will commonly feel the membranes with the waters pushed down through the os uteri; or, if they are broken, the head or some part of the body will be felt. If, therefore, the woman has strong pains, and is in no danger from floodings or weakness, provided the head presents fair, and seems to come along, she will be delivered of this also in the natural way.

If the membranes are not broken, if the head does not immediately follow, or if the child presents wrong, he ought to turn and bring it immediately by the feet, in order to save the patient the fatigue of a second labour, that may prove tedious and even dangerous by enfeebling her too much. Besides, as the parts are fully opened by the first delivery, he can introduce his hand with ease; and as the membranes are for the most part whole, the waters may be kept up, and the fœtus easily turned, as in chap. iv, sect. 3; but if the pelvis is narrow, the woman strong,

and the head presents, he ought to leave it to the efforts of nature.

[With regard to the management of the second birth, Smellie fully recognises the importance of its being effected soon after that of the first child, a principle strongly enjoined by Ould, Chapman, and other old authors. But such prompt and active interference as they counsel is very seldom needed. Where the head of the second child presents, rupturing the membranes, friction over the uterus and a dose of ergot will generally suffice to provoke the necessary uterine contractions. The most favourable presentation of the second fœtus is with the leg. If the circumstances of the patient were such as to necessitate the artificial delivery of the first child, then, indeed, we might advantageously follow the advice of Smellie, and forthwith proceed to turn the second child, even supposing its head to present.]

If the first child presents wrong, and in turning that he feels another, he must beware of breaking the membranes of one while he is at work upon the other; but should they chance to be broke, and the legs of both entangled together, (though this is seldom the case, because they are commonly divided by two sets of membranes), let the operator, when he has got hold on two legs, run up his fingers to the breech, and feel if they belong to the same body; and one child being delivered, let the other be turned and brought out in the same manner. If there are more than two, the same method must take place, in extracting one after another.

[I have never yet met an example of twins being contained in the same bag of membranes; and that this must be a rare anomaly is plain from the fact that the amnios is really formed from the embryo, and not from the uterus or ovum. However, instances are not wanting where this anomaly was found to exist. Arneth and Spaeth, of Vienna, have met with it; the latter in two cases out of 126.

Whenever we know there is a second child a ligature should be applied on the maternal end of the funis after its division, lest there

should be any vaseular communieation in the placenta between the two eords—a eondition of things which Spaeth has demonstrated to be not very unfrequent.]

In case of twins, the plaeenta of the first seldom comes along until the second ehild is delivered ; but as this does not always happen, he ought, as formerly directed, to certify himself that there is nothing left in the uterus, when the cake eomes of itself. Both children being delivered, let him extraet both plaeentas, if they come not of themselves ; and if they form distinct cakes, separate first one, then the other ; but if they are joined together, forming but one mass, they may be delivered at once, as in chap. ii, seet. 5.

When there are three or four children, (a ease that rarely happens), the placentas are sometimes distinct, and sometimes altogether form but one round cake ; but when this is maeerated in water for some days, they, with their several membranes, may be easily separated from one another ; for they only adhere in consequence of their long pressure in the uterus, and seldom have any communication of vessels, although such a eommunication hath lately fallen under my observation. See Book I, chap. iii, sect. 5. Twins for the most part lie diagonally in the uterus, one below the other ; so that they seldom obstruet one another at the os internum. See Collect. XXXVII, and Tab. X.

[Experienee has shown that the presenee of a seeond fœtus may, apart from any malformation or unnatural union, cause an obstacle of very serious kind to delivery. This generally arises from the head of one ehild and lower extremity of the other entering the pelvis together, or from a lower extremity of eaeh twin presenting simultaneously. In the former case we should endeavour to push up the leg, so as to allow the head to oeeupy the pelvis. This was successfully done in a case reeorded by Dr. Hardy and myself (' Praetical Obs. on Mid.,' p. 332, Case 71). It may fairly be asked how it was known that in this ease the head was that of a seeond child? The presence of the membranes eovering it, and not the foot, at

once showed, however, that there were twins. It is possible that the membranes of the second child may have given way, and then the difficulty of diagnosis would be very great; hence the value of the rule, in all cases of foot and head presentation, to push up the head and bring down the foot, unless the former be well engaged in the pelvis, when we might safely push up the foot. If the body of the first child be expelled, and the heads are locked in the pelvis, it will be impossible to save both children, and rarely does one escape. But even here nature may sometimes overcome the obstacles to delivery, of which Dr. T. Ferguson ('Dub. Med. Trans.,' i, p. 145) and Dr. Clough ('Med. and Phys. Jour.,' xxv) have published examples. Such a result, however, is never to be calculated on unless the children be premature, as in Mr. Allan's case ('Med.-Chir. Trans.,' xii). He suggested a plan of treatment, which was put into practice by Mr. Eton ('Med. Gaz.,' July 24th, 1846), and Mr. Bunting ('Lancet,' October, 1875). The plan is this: the body of the first child was detruncated, and its head pushed up out of the way; the second child was then extracted with the forceps and lastly, the detached head was removed from the uterus. For amputating the head Mr. Bunting used a bass string wrapped round with wire of a pianoforte. Another plan—and probably the best—is to perforate the head of first child (whose death we can know to a certainty), and then extract it. Dr. C. Johnson pursued this plan once, and with success, though the second child was stillborn. Mr. Junior records a case where both heads had to be perforated before delivery could be effected ('Ed. Med. and Surg. Jour.,' xviii).

Of the other variety of bifœtal presentation Amand relates a case where he found three feet presenting. By careful examination he ascertained the two belonging to the same fœtus, and brought them down ('Nouvelles Obs. sur la Pratique des Accouchmens, p. 83.) Dr. F. H. Ramsbotham was once called to a case where a leg of each child was beyond the vulva. "Although they were right and left," he remarks, "I immediately detected, by the direction of the toes, that they belonged to different bodies; by gently pushing up one and careful traction at the other leg I extricated each breech from the brim of the pelvis, and both children were born living."

The old notion that females born co-twins with males would prove sterile, has been completely refuted. The mortality among women after twin births, is three or four times greater than after

single births. In the management of labour with three or four children, the very same principles of treatment should guide us as in that of twin births.

The relative frequency of twin births differs somewhat in different countries and races. Out of 208,440 women delivered in the Dublin Lying-in Hospital, 2099 gave birth to two or more children (*i.e.* about *one* in *sixty-seven*); and of these latter, forty-three had triplets.]

Sect. 2.—*Of Monsters.*

Two children joined together by their bellies (which is the most common case of monstrous births) or by the sides, or when the belly of the one adheres to the back of the other, having commonly but one funis, are comprehended in this class, and supposed to be the effect of two animalcula impregnating the same ovum, in which they grow together, and are nourished by one navel-string, originally belonging to the secundines; because the vessels pertaining to the coats of the veins and arteries do not anastomose with the vessels belonging to the fœtus.

In such a case, where the children were small, the adhesion hath been known to stretch in pulling at the feet of one, so as to be delivered; and the other hath been afterwards brought along in the same manner, without the necessity of a separation.

When the accoucheur is called to a case of this kind, if the children are large, and the woman come to her full time, let him first attempt to deliver them by that method; but if, after the legs and part of the body of the first are brought down, the rest will not follow, let him slide up his hand, and with his fingers examine the adhesion; then introducing the scissors between his hand and the body of the fœtus, endeavour to separate them by snipping through the juncture. Should this attempt fail, he must diminish the bulk in the best manner he can think of, and bring the

body of the first, in different pieces, by pulling or cutting them asunder, as he extracts with the help of the crotchet.

No certain rules can be laid down in these cases, which seldom happen; and therefore a great deal must be left to the judgment and sagacity of the operator, who must regulate his conduct according to the circumstances of the case, and according to the directions given for delivering when the pelvis is narrow and the children extraordinary large.

Formerly, practitioners used straight and crooked knives with long handles, which were introduced into the uterus along the hand, in order to cut and divide the bodies of children, that they might be extracted piecemeal; and this cruel practice obtained even in some cases which we can now manage with ease and safety by turning and delivering the fœtus by the feet. But, no doubt, some will happen in which it is impossible to preserve or deliver the children without the help of instruments; and in such an emergency the scissors are much safer than knives, with which the operator runs the risk of cutting the uterus or himself; whereas he is exposed to no such hazard from the other, which cut only betwixt the points. See Collect. XXXVIII.

[The varieties of monstrosity likely to occasion difficulty in parturition are the following:

1. Where two separate fœtal bodies are united either anteriorly or posteriorly.

2. Dicephalous monsters with a single trunk but with two distinct heads.

3. Monsters having two bodies more or less completely separate, and a single head, or intimate fusion of two heads.

A monster answering to any one of these descriptions would hardly seem to be capable of birth by the natural efforts; nevertheless out of thirty-one cases collected and tabulated by Dr. Playfair, no fewer than twelve were born naturally and without any considerable difficulty: in the other cases delivery was accomplished by turning, craniotomy, decapitation, or the forceps, severally, or by two, or more of these means combined; but in no instance was it necessary to

resort to hysterotomy. Dr. Playfair communicated a most admirable and exhaustive essay on this whole subject to the Obstetrical Society of London in 1866, and as I can add nothing to what he has written, I must only refer the reader, who may desire further information on this subject, to his paper contained in the eighth volume of the 'Transactions' of that Society.]

Sect. 3.—*Of the Cæsarian Operation.*

When a woman cannot be delivered by any of the methods hitherto described and recommended in laborious and preternatural labours, on account of the narrowness or distortion of the pelvis, into which it is sometimes impossible to introduce the hand; or from large excrescences and glandular swellings, that fill up the vagina, and cannot be removed; or from large cicatrices and adhesions in that part and at the os uteri, which cannot be separated; in such emergencies, if the woman is strong and of a good habit of body, the Cæsarian operation is certainly advisable, and ought to be performed; because the mother and child have no other chance to be saved, and it is better to have recourse to an operation which hath sometimes succeeded, than leave them both to inevitable death. Nevertheless, if the woman is weak, exhausted with fruitless labour, violent floodings, or any other evacuation which renders her recovery doubtful, even if she were delivered in the natural way; in these circumstances it would be rashness and presumption to attempt an operation of this kind, which ought to be delayed until the woman expires, and then, immediately performed with a view to save the child.

The operation hath been performed both in this and the last century, and sometimes with such success that the mother has recovered and the child survived. The previous steps to be taken are—to strengthen the patient, if

weak, with nourishing broths and cordials; to evacuate the indurated fæces with repeated glysters, and, if the bladder is distended with urine, to draw it off with a catheter. These precautions being taken, she must be laid on her back on a couch or bed, her side on which the incision is to be made being raised up by pillows placed below the opposite side; the operation may be performed on either side, though the left is commonly preferred to the right, because in this last the liver extends lower. The apparatus consists of a bistoury, probe-scissors, large needles threaded, sponges, warm water, pledgets, a large tent or dossil, compresses, and a bandage for the belly.

If the weather is cold the patient must be kept warm, and no part of the belly uncovered except that on which the incision is to be made; if the operator be a young practitioner, the place may be marked by drawing a line along the middle space between the navel and the os ilium, about six or seven inches in length, slanting forwards towards the left groin, and beginning as high as the navel.

According to this direction, let him hold the skin of the abdomen tense between the finger and thumb of one hand, and with the bistoury in the other make a longitudinal incision through the cutis to the membrana adiposa, which, with the muscles, must be slowly dissected and separated until he reaches the peritoneum, which must be divided very cautiously for fear of wounding the intestines that frequently start up at the sides, especially if the membranes are broken, the waters discharged, and the uterus contracted.

The peritoneum being laid bare, it may be either pinched up by the fingers, or slowly dissected with the bistoury, until an opening is made sufficient to admit the forefinger, which must be introduced as a director for the bistoury or scissors in making an effectual dilatation. If

the intestines push out, let them be pressed downwards so as that the uterus may come in contact with the opening. If the womb is still distended with the waters, and at some distance from the child, the operator may make upon it a longitudinal incision at once; but if it is contracted close round the body of the fœtus he must pinch it up, and dilate in the same cautious manner practised upon the peritoneum, taking care to avoid wounding the Fallopian tubes, ligaments, and bladder; then introducing his hand he may take out the child and secundines. If the woman is strong the uterus immediately contracts, so as that the opening, which at first extended to about six or seven inches, is reduced to two, or less; and in consequence of this contraction, the vessels being shrunk up, a great effusion of blood is prevented.

The coagulated blood being removed, and what is still fluid sponged up, the incision in the abdomen must be stitched with the interrupted suture, and sufficient room left between the last stitch and the lower end of the opening for the discharge of the moisture and extravasated fluid. The wound may be dressed with dry pledgets or dossils dipped in some liquid balsam, covered with compresses moistened with wine, and a bandage to keep on the dressings and sustain the belly. Some authors observe that the cutis and muscles only should be taken up in the suture, lest bad symptoms should arise from stitching the peritoneum.

The woman must be kept in bed as quiet as possible, and everything administered to promote the lochia, perspiration and sleep, which will prevent a fever and other dangerous symptoms. If she hath lost a great quantity of blood from the wounds in the uterus and abdomen so as to be in danger from inanition, broths, caudles, and wine, ought to be given in small quantities, and frequently repeated; and the *Cort. Peruvian* administered in powder, decoc-

tion, or extract, may be of great service in this case. For further information on this subject the reader may consult Russetus, the Memoirs of the Academy of Surgeons at Paris, and Heister's Surgery. See Collect. XXXIX.

[The reader who wishes to be informed in all details of the Cæsarian section, will do well to consult Dr. Barnes' 'Lectures on Obstetric operations,' or Dr. Playfair's recent treatise on 'The Science and Practice of Midwifery.' Smellie takes as usual a sound common sense view of this matter. It does not appear that he himself ever performed the operation during the life of the mother; but he relates three cases (Nos. 430, 431, and 432), where he did so immediately after her death.

The first British author who notices this operation is Sir F. Ould, 1742, ('Midwifery,' p. 195). He regards it as "most certainly mortal," basing this conclusion on the universal fatality of punctured wounds of the abdomen, and the certainty of hæmorrhage from the incised wound. Though so strongly averse to it, he yet does admit of one possible exception, namely, "when the pubis and sacrum are so preternaturally near each other, that the operator's hand cannot push between them in order to come at the child." Neither Giffard (1734), Chapman (1733), nor Eaton (1751), mentions the operation.

Modern skill and ingenuity have devised means whereby the operation of craniotomy can be accomplished through a pelvis of much smaller dimensions than would have admitted of delivery in Smellie's day and with the resources at his command. But it remains to be proved whether in the cases where the pelvis is so small that the conjugate diameter is only two inches, or thereabouts, the maternal mortality is less than in the cases of Cæsarian section operated on at an early stage of labour. To settle this point reliable data are as yet wanting. Dr. John S. Parry, of Philadelphia, has considered this particular aspect of the question. ('Amer. Jour. of Obstetrics,' vol. v). He "is forced to conclude that perforation and breaking up of the fœtus is not more successful than Cæsarian section in pelves with a conjugate two and a half inches or less." He has been at the pains of collecting and tabulating seventy cases where delivery was effected by craniotomy, the pelvis being of the size above mentioned. Of these, 61 per cent. recovered, and 38 per cent. died, which is a higher death-rate than

that of Cæsarian section in America or on the continent of Europe; for Dr. Harris has shown the former to be 26 per cent. of cases operated on "during or at the close of the first day of labour;" and M. Dufielly shows that in Europe, where the operation was performed early and before the patient had become exhausted, only 19 per cent. died; this conclusion being deduced from all the cases operated on between the years 1845 and 1861. Mr. W. H. Jones has also written on this subject an able monograph, which is especially valuable for containing the particulars of fifty-one cases of deformed pelvis observed by him at the Clinique d'Accouchments, Paris.

This great question must eventually be decided by statistics, but there is great need for caution, in order to guard against fallacies. Now to make a just and fair comparison between craniotomy and Cæsarian section, in the risk which each entails to the mother, it is of very great importance that in the two groups of cases, the circumstances of the patients at the time when the extreme measure was resorted to, should be as *nearly alike as possible*. This, I fear, has not been done, and thus a disturbing element has been introduced which vitiates the conclusion which is drawn from them. For example, if craniotomy be not practised till after the patient has been suffering the pangs of labour for many hours, it is not reasonable or fair to attribute a fatal result solely to the mode of delivering; nor would it be fair to institute a comparison of a number of such cases with those of Cæsarian section performed at the outset of labour, or before any ill effects of delay have appeared. According to Dr. Radford, the death-rate which has followed the operation of hysterotomy in Great Britain is 85·71 per cent.; but the reason of this high rate doubtless is, that in a large proportion of the cases the labour was let run too far before Cæsarian section was performed; and for a like reason the results of craniotomy on the continent show a large mortality among the patients.]

BOOK IV.

CHAPTER I.

OF THE MANAGEMENT OF WOMEN FROM THE TIME OF THEIR DELIVERY TO THE END OF THE MONTH, WITH THE SEVERAL DISEASES TO WHICH THEY ARE SUBJECT DURING THAT PERIOD.

SECT. 1.—*Of the External Application.*

THE woman being delivered of the child and placenta, let a soft linen cloth, warmed, be applied to the external parts, and if she complains much of a smarting soreness, some pomatum may be spread upon it. The linen that was laid below her, to sponge up the discharges, must be removed, and replaced by others that are clean, dry, and warm. Let her lie on her back with her legs extended close to each other, or upon her side, if she thinks she can lie easier in that position, until she recovers from the fatigue; if she is spent and exhausted let her take a little warm wine or caudle, or, according to the common custom, some nutmeg and sugar grated together in a spoon; the principal design of administering this powder, which among the good women is seldom neglected, is to supply the want of some cordial draught when the patient is too weak to be raised, or supposed to be in danger of retchings from her stomach's being overloaded. When she hath in some measure recovered her strength and spirits let the cloths be removed from the parts and others applied in their room, and if there is a large discharge from the uterus let

the wet linen below her be also shifted that she may not run the risk of catching cold.

When the patient is either weak or faintish, she ought not to be taken out of bed, or even raised up to have her head and body shifted until she is a little recruited, otherwise she will be in danger of repeated faintings, attended with convulsions, which sometimes end in death. To prevent these bad consequences her skirt and petticoats ought to be loosened and pulled down over the legs, and replaced by another, well warmed, with a broad head-band to be slipt in below, and brought up over her thighs and hips; a warm double cloth must be laid on the belly, which is to be surrounded by the head-band of the skirt pinned moderately tight over the cloth, in order to compress the viscera and the relaxed parietes of the abdomen, more or less, as the women can easily bear it, by which means the uterus is kept firm in the lower part of the abdomen and prevented from rolling from side to side when the patient is turned; but the principal end of this compression is to hinder too great a quantity of blood from rushing into the relaxed vessels of the abdominal contents, especially when the uterus is emptied all of a sudden by a quick delivery. The pressure being thus suddenly removed the head is all at once robbed of its proportion of blood and the immediate revulsion precipitates the patient into dangerous lypothymia.

For this reason the belly ought to be firmly compressed by the hands of an assistant until the bandage is applied; or, in lieu of it, a long towel, sheet, or roller, to make a suitable compression; but for this purpose different methods are used in different countries, or according to the different circumstances of the patients. The head-clothes and shift ought also to be changed, because, with sweating in time of labour, they are rendered wet and disagreeable. Several other applications are necessary when the external or in-

ternal parts are rent or inflamed, misfortunes that sometimes happen in laborious and preternatural cases.

The directions for ordering the bed in time of labour, and for the applications after delivery, are absolutely necessary to be known by young practitioners, because all these precautions are for the ease and safety of the patient when attended by inexperienced nurses.

[It is plain from the foregoing observations that Smellie was strongly in favour of the application of a binder round the abdomen after delivery. But this, like many of his other practical injunctions, did not meet the approval of Denman, and the binder fell into disuse in England for many years. It is now, however, very generally employed there, as it always has been in the Dublin Lying-in Hospital. Although a binder should be worn by the patient for some days after delivery (or until she can put on her stays), it is only necessary for the accoucheur to apply it in the first instance; the nurse can do so afterwards. Not only "the directions for ordering the bed," but all the little details of the bedding, dress, food, and drinks of the patient as well as of the infant, should be known by the accoucheur, and every office or duty that may be required of the nurse, he should understand and be competent to perform. When I was Master of the Dublin Lying-in Hospital I encouraged the pupils to wash and dress the infants occasionally, in order to give them a practical acquaintance with these small, but not unimportant matters.]

Numb. 1.—*Inflammation and Sloughing of Vagina.*

Inflammations of the labia pudendi, rectum, urethra, vagina and uterus, chiefly happen when the head, shoulder, breech, or any other part of the fœtus, hath been forced into the pelvis, and long detained in that situation; so that by many strong pains the delivery was effected, or great force and violence were required to turn or extract the child. These inflammations, if slight, are commonly relieved, or altogether resolved, by a plentiful discharge of the lochia, rest, and profuse sweating; but, if violent, blooding, warm

fomentations, cataplasms, and emollient glysters, may be necessary, though the first and last must be used with caution.

If the pressure hath been so great as totally to obstruct the circulating fluids in those parts a mortification ensues, either total, by which the woman is soon destroyed, or partial, when the mortified parts separate and cast off in thick sloughs, then digest, and are healed as a common sore, provided the patient be of a good habit of body; but if the opposite parts are also affected in the same manner, and both sides pressed together, as, for example, in the uterus, os internum, vagina, or os externum, or if the internal membrane of the whole inner surface sloughs off, then there is danger of a coalescence or growing together, by which are formed callosities; and these, if they happen in the os internum, vagina, or os externum, will produce difficult and dangerous labours in the next parturition, and if in the uterus will altogether prevent conception, though this rarely happens, because of the continual draining of the moisture that is discharged from the womb. In order to avoid this mischance, emollient injections ought frequently to be thrown up into the uterus, and large tents or dossils dipt in vulnerary balsams applied in the vagina and os externum.

[Early in my professional life I saw many instances of sloughing of the vagina, as well as of cicatrices, adhesions, and fistulæ consequent thereon. The cause of sloughing in nearly all these cases was undue protraction of the second stage of labour; the head being allowed to remain too long engaged in the pelvis; not necessarily locked or impacted there in the first instance, but becoming tightly wedged there after some hours, in consequence of the congestion, swelling and dryness of the soft parts. These sad occurrences can all be prevented by the timely interposition of art; and the earlier employment of the forceps, during recent years, has tended most materially to lessen the frequency of such lesions. Simpson I think it was who stated that strong pressure for a short time, such

as the forceps might produce, was less likely to do serious harm, than a minor degree of pressure exerted without intermission throughout a long period, after the sloughs have been thrown off, a good deal can be done by the means which our author describes, to prevent adhesions taking place between the raw surfaces; but it is next to impossible to prevent the contraction of the subsequent cicatrices; and the bands thus formed in the vagina, become serious impediments to delivery in any future confinement, causing great difficulty and danger, and not uncommonly leading to rupture of the vagina or of the uterus.]

Numb. 2.—*Sloughing of Vagina and Urinary Fistula.*

If, in consequence of the long pressure of the child's head at that part of the vagina where its outward surface is attached to the back and under part of the bladder, the mortification affects the coats of the vesica urinaria, as well as those of the vagina, when the sloughs fall off, the urine will pass that way, and hinder the opening (if large) from being closed; this is an inexpressible inconvenience and misfortune to the poor woman, both from the smell and continual wetting her clothes. The vagina and bladder may also be lacerated by the forceps, crotchet, or any other instrument imprudently forced up; but, in that case, the urine is immediately discharged through the wound: whereas, in a mortification, it comes off in a natural way, until the slough begins to separate and fall off.

As soon as this misfortune is known, the cure ought to be attempted; this (according to some) consists in keeping a flexible catheter always in the bladder, that the urine may be continually solicited to come through the urethra rather than through the vagina; but if this precaution hath been neglected, and the lips of the ulcer are turned callous, we are directed to pare them off with a curved knife, buttoned at the point, or consume them with lunar caustic; and, if the opening is large, to close it with a double stitch, keeping

the flexible catheter in the bladder until it is entirely filled up; but I wish this operation may not be found impracticable.

[The wish here ejaculated, reveals very plainly Smellie's disbelief in the success of any plastic operation for the closing of vesico-vaginal fistulæ. Very many years elapsed before the practicability of a cure by such attempts was thoroughly established, and until Bozeman, Marion Sims, and Baker Brown opened a new era in the treatment of these sad cases, the results of operations upon them were most discouraging, a satisfactory issue being hardly ever obtained. Now, however, it is quite the reverse and success is the rule, failure the rare exception.]

Numb. 3.—*Laceration of the Perineum and Uterus.*

The os externum is frequently tore, particularly at the perineum; and sometimes the laceration reaches to the anus. At other times, (but more seldom), both vagina and rectum are tore for the space of two or three inches upwards, and the two form but one cavity at the lower part. This laceration is frequently occasioned from the excessive largeness of the child's head; from the rigidity of the fibres in women who are near the borders of forty when their first children are born; from the accoucheur's neglecting to slide the perineum over the head when it is forcibly propelled by the pains, or from his omitting to keep up the head with the flat of his hand that it may not come too suddenly along; from too great violence used in laborious or preternatural labours; and from the operator's incautious manner of thrusting in his hand. If the laceration be small, the part soon heals up, and the only inconvenience attending the wound is a smarting after making water; and when the laceration is large, extending to the edge of the sphincter ani, or even farther, this pain is still more troublesome, and increased upon the least motion, by the friction of the lips against each other. This disagreeable

rubbing, is (according to some writers) prevented by making two deep stitches that will keep the lips together; but in this case, we can seldom cure by the first intention, on account of the moisture that is continually passing that way, namely, the lochia and urine, that insinuate themselves into the wound. Besides, the lips are tore and ragged, and the hold we have is but slender.

In the third case, it is supposed that there is an absolute necessity to make, as soon as possible, two, three, or sometimes four, deep stitches through the tore vagina and rectum, the knots being tied in the vagina, and two more stitches in the perineum, to assist the re-union of the parts; for if the sphincter ani is entirely separated, and continues in that condition, the patient can seldom retain her excrements for any length of time. If this misfortune should remain unknown, or the operation unperformed, on account of the woman's weakness, until the lips of the wound are grown callous, these callous edges must be pared off with scissors; or, if that should be found impracticable, scarified with the point of a lancet or bistoury, and then stitched as above directed; and the stitches must be made very deep, otherwise they will not hold; because there is but little muscular flesh in the vagina and rectum; but the colon ought first to be emptied with glysters, and the patient take little or no solid food, that the stitches may not be overstrained when she goes to stool. When the laceration reaches so high as to endanger the woman's retentive faculty, this method, doubtless, ought to be tried; but not otherwise, because the operation very rarely succeeds.

[It is always the duty of the accoucheur to attempt union by the first intention when any considerable laceration takes place. With ordinary care in the use of the sutures, I find it to be rare for union not to take place. I have alluded to this subject at page 208, so need say no more upon it here.]

When the os internum is tore from the same causes, all

that can be done is to keep the patient strictly to the regimen we have directed for women after delivery, and take care that she shall move as little as possible during the first three weeks.

The rents or lacerations that happen to the uterus are of more dangerous consequence, and indeed commonly accounted mortal; therefore they demand the utmost care and circumspection, in all the different cases. If the patient is plethoric, she ought to be blooded, in order to prevent a fever, unless she hath undergone a considerable discharge from the uterus; she ought to be kept very quiet and motionless; to take nothing but spoon-meat, and even of that a little at a time; and drink diluting liquors, such as barley-water and very weak broths.

[It is very remarkable that these few sentences contain nearly all the information Smellie gives upon the gravest accident which can happen to the parturient woman. It is most probable, however, that his experience of such cases was very limited, and we know that he derived his knowledge chiefly from clinical experience, and very little from books. If we are to judge from his recorded cases, it would seem that he only met with two examples of rupture, one of the uterus ending fatally (case 442); the other of the vagina ending in recovery (case 441). Both occurred very early in his practice, and both women had contracted pelves. That he regarded these lacerations as almost of necessity mortal, we can learn from case 443, when the narrator (an old pupil of his), having diagnosed a rupture of the uterus, observes: "According to your prudent advice, I spoke nothing of the matter, but pronounced her a dead woman, and she accordingly expired in less than six hours." That Smellie should have entertained this gloomy idea—this "almost criminal despondency" as Andrew Douglas calls it, with regard to the prognosis in rupture of the uterus, cannot be wondered at. The same impression was shared in by William Hunter, and all the other leading accoucheurs up to the publication of Dr. A. Douglas' case of recovery from rupture of the uterus (or vagina), in 1785. About the same time Mr. Goldson published a case of rupture of the vagina, and pointed out with considerable clearness many points of

difference between rupture of the uterus and rupture of the vagina. Most succeeding writers, even some of the latest—have in a great measure overlooked these differences, which is somewhat strange, seeing that they affect the symptoms, pathology, treatment and prognosis.

The symptoms arising from laceration of the uterus or vagina during labour, are essentially the same. There is no symptom peculiar to the one, or to the other accident; and therefore no single symptom pathognomonic of either. Nevertheless, as regards the frequency and prominence of individual symptoms experience shows a considerable difference between the two lesions. In addition to the symptoms laid down in most of the text books, such as vomiting, collapse, hæmorrhage, cessation of labour pains, recession of the presenting part, &c., I would add two others not generally recognised, but which experience has taught me to set some value upon. One of these is an emphysematous condition of the integument of the hypogastrium. This symptom I had never seen described when I first observed it in 1857 ('Dub. Med. Jour.,' Nov. 1857, p. 450). Since then its presence has been recognised by other observers, and what is very interesting it has been detected in cases of rupture of the bladder in males; another corroborative proof of rupture having occurred is cessation of the fœtal heart's sounds. In obscure or doubtful cases of rupture, the persistence of the cardiac sounds would very strongly negative the suspicion of rupture having occurred, as nearly all experience goes to show that the death of the infant very speedily follows upon this accident, whether of the vagina or uterus. As regards the relative frequency of the two lesions, *i.e.* laceration of the uterus and laceration of the vagina, I can only speak from the data supplied by the Dublin Lying-in Hospital, where of 108 cases of rupture, thirty-five engaged the vagina and seventy-three the uterus. The elaborate statistics collected by Trask cannot be relied on to guide us here, as he observes no distinction between laceration of the uterus and laceration of the vagina.

As regards the degree of danger attendant upon the two accidents there can be no question that rupture of the vagina is not so fatal as rupture of the uterus. Referring again to the experience of the Dublin Lying-in Hospital we find that the recoveries after the former were in the proportion of 12 per cent., whilst of the latter (rupture of uterus) they were only 4½ per cent. Two very inter-

esting cases of laceration of the vagina during labour, followed by recovery, are recorded in the seventeenth volume of the 'Transactions of the London Obstetric Society:' one of these is narrated by Dr. Heywood Smith, and the other by Dr. Wiltshire. Dr. Gaillard Thomas, of New York, has also recently published a case of recovery from vaginal laceration. ('Amer. Jour. of Obstetrics,' August, 1875.)

Rupture very rarely occurs in first labours, only one example of such having ever come under my knowledge.

The diagnosis of rupture being clearly established, the necessity for immediate delivery is unquestionable. When the fœtus has escaped out of the uterus into the abdominal cavity, its extraction thence by gastrotomy, has been strongly advocated of late years; not with the idea (as Douglas and Ramsbotham supposed) of saving the child merely—though this would be some inducement for its performance, however remote the chance of success—but in the belief that the mother would have a better chance of recovery by this proceeding than if the child were allowed to remain in the belly (as Denman for some time recommended) or extracted *per vias naturales*. Dr. Murphy is one of those who are strongly in favour of gastrotomy under these circumstances, and the arguments he brings forward are, I think, very convincing. It has now been performed in many cases—some of them in Great Britain—with very encouraging results. M. Jolly has given a comparison of the results of the various modes of treatment, and from his statistics it plainly appears that gastrotomy holds out the best chance for the patient. Dr. Murphy speaks very truly when he says "the chief objection to this operation and that which is most difficult to meet, is popular prejudice. Any operation that is not seen, however painful it may be, or however dangerous, is not looked upon with the same horror as when the surgeon takes his knife and proposes to cut into the abdomen. Although both operations—turning and gastrotomy—may be equally fatal, still the former will not share anything like the opprobrium that attaches to the latter." ('Midwifery,' 2nd. edit., p. 538.) In the after treatment of rupture the medicinal agent on which most reliance is to be placed is opium.

From an essay I published some years ago on this subject, I shall briefly recapitulate the principal points in which *laceration of the vagina* seems to differ from laceration of the uterus.

1. Premonitory symptoms are very rare.

2. The immediate constitutional effect of laceration of the vagina is not, on the whole, so profound as that arising from rupture of the uterus.

3. Vomiting is occasionally a symptom of the accident, but it is not of the *coffee-grounds* character.

4. The laceration is very rarely, if ever, induced by deformity of the pelvic brim.

5. The head is commonly engaged in the pelvis at the time the laceration occurs.

6. The tear can in no way be attributed to contractions of the structure directly involved.

7. The laceration almost always takes a circular direction, and

8. Remains patulous, or at least shows very little disposition to contract.

9. The escape of the fœtus into the peritoneal cavity follows more frequently upon the vaginal laceration than upon uterine rupture.

10. The escape of the placenta, likewise, through the laceration, is more apt to take place here than in ruptures of the uterus.

11. Prolapse of the intestine, also, is a less rare complication of vaginal laceration than of uterine rupture.

12. The operation of turning is found to be practicable for a longer period after laceration of the vagina than of the uterus.

The four preceding characteristics (Nos. 9, 10, 11, 12) naturally result from the peculiarity stated in No. 8, as belonging to lacerations of the vagina or os uteri.

13. There is a greater liability to pelvic abscess after vaginal laceration; and this we may, in some degree, attribute to the greater likelihood of atmospheric air entering the belly through the solution of continuity in the vaginal canal.

14. Lastly, a comparison of the mortality of these two lesions clearly proves that vaginal laceration is a much less fatal accident than uterine rupture ('Dub. Med. Jour.,' May, 1866).]

Sect. 2.—*Of Air, Diet, Sleeping and Watching, Motion and Rest, Retention and Excretion, and the Passions of the Mind.*

Although we cannot remove the patient immediately after delivery into another climate, we can qualify the air, so as to keep it in a moderate and salutary temper, by rendering it warm or cold, moist or dry, according to the circumstances of the occasion. With regard to diet, women in time of labour, and even till the ninth day after delivery, ought to eat little solid food, and none at all during the first five or seven; let them drink plentifully of warm diluting fluids, such as barley water, gruel, chicken-water, and teas, caudles are also commonly used, composed of water-gruel boiled up with mace and cinnamon, to which, when strained, is added a third or fourth part of white wine, or less if the patient drinks plentifully, sweetened with sugar to their taste; this composition is termed white caudle; whereas, if ale is used instead of wine, it goes under the name of brown caudle. In some countries, eggs are added to both kinds; but in that case, the woman is not permitted to eat meat or broths till after the fifth or seventh day; in this country, however, as eggs are no part of the ingredients, the patient is indulged with weak broth sooner, and sometimes allowed to eat a little boiled chicken. But all these different preparations are to be prescribed weaker or stronger, with regard to the spices, wine, or ale, according to the different constitutions and situations of different patients; for example, if she is low and weak, in consequence of an extraordinary discharge of any kind either before or after delivery, or if the weather is cold, the caudles and broths may be made the stronger; but if she is of a full habit of body, and has the least tendency to a fever, or if the season is excessively hot, these drinks ought

to be of a very weak consistence, or the patient restricted to gruel, tea, barley, and chicken water, and these varied according to the emergency of the case.

Her food must be light and easy of digestion, such as panada, biscuit, and sago: about the fifth or seventh day, she may eat a little boiled chicken, or the lightest kind of young meat; but these last may be given sooner or later, according to the circumstances of the case and the appetite of the patient. In the regimen as to eating and drinking, we should rather err on the abstemious side, than indulge the woman with meat and strong fermented liquors, even if these last should be most agreeable to her palate; for we find by experience, that they are apt to increase or bring on fevers, and that the most nourishing and salutary diet is that which we have above prescribed. Every thing that is difficult of digestion, or quickens the circulating fluids, must of necessity promote a fever, by which the necessary discharges are obstructed, and the patient's life endangered.

[It surely was a great inconsistency forbidding the use of animal food, and yet allowing the patient to drink plentifully of *caudle*, a principal ingredient in which was wine or ale! For several years past I have given puerperal patients a liberal allowance of food from the time of delivery, and am convinced it is, as a rule, the proper course to pursue; at the same time I quite agree with Smellie that "we should rather err on the abstemious side than indulge the woman with meat and strong fermented liquors." I do not generally allow any wine till the fifth day, and porter or ale not till after the eighth day. From their liability to affect the child, or produce flatulence and acidity, vegetables are better withheld till the second or third week of convalescence. The arrangement I make for the patient's meals is somewhat as follows:—Breakfast at 8.30 or 9 o'clock, of tea, egg, and bread and butter; lunch at noon, of bread and beef-tea or chicken broth; dinner at 3 o'clock; tea and bread and butter at 6 o'clock; and supper of bread and boiled milk, or gruel, or corn-flour, &c., at 9 o'clock. If awake in the night she may get some rennet-whey, beef-tea, or chicken-tea. On the third or fourth day I permit white meat (chicken, rabbit, partridge, quail, or lamb) for

dinner; and on fifth day same, with some sherry or Marsala and water.]

As to the article of sleeping and watching, the patient must be kept as free from noise as possible, by covering the floors and stairs with carpets and cloths, oiling the hinges of the doors, silencing the bells, tying up the knockers, and, in noisy streets, strewing the pavement with straw: if, notwithstanding these precautions, she is disturbed, her ears must be stuffed with cotton, and opiates administered to procure sleep; because watching makes her restless, prevents perspiration, and promotes a fever.

[The importance of quiet and sleep during the nine or ten days succeeding parturition, cannot be over-estimated. Popular opinion is here altogether on the right side. Under no circumstances, perhaps, does the beneficial influence of

"Tired nature's sweet restorer, balmy sleep,"

appear so strikingly manifest, as immediately after delivery. To secure as far as possible undisturbed repose to the patient, the child should be kept in another room at night, away from the mother, who should have some composing draught to take if required—one containing chloral and morphia will rarely disappoint. Sleep tends most powerfully to restore to the nervous, vascular, and psychical systems their normal equilibrium, which parturition so materially disturbs. The ill effects of loss of sleep to the puerperal patient are wont to show themselves by headache, thirst, feverishness, and general irritability. Sometimes the symptoms eventuate in actual mania, if their cause be not recognised and proper measures used for its removal.]

Motion and rest are another part of the non-naturals to which we ought to pay particular regard. By tossing about, getting out of bed, or sitting up too long, the perspiration is discouraged and interrupted; and in this last attitude the uterus, not yet fully contracted, hangs down, stretching the ligaments, occasioning pain, cold shiverings, and a fever: for the prevention of these bad symptoms, the patient must be

kept quiet in bed till after the fourth or fifth day; and then be gently lifted up in the bed-clothes, in a lying posture, until the bed can be adjusted, into which she must be immediately reconveyed, there to continue, for the most part, till the ninth day; after which period women are not so subject to fevers as immediately after delivery. Some there are who, from the nature of their constitutions or other accidents, recover more slowly; and such are to be treated with the same caution after as before the ninth day, as the case seems to indicate. Others get up, walk about, and recover, in a much shorter time; but these may, some time or other, pay dearly for their fool-hardiness, by encouraging dangerous fevers; so that we ought rather to err on the safe side, than run any risk whatsoever.

[It is quite true, as Smellie here indicates, that with some women convalescence proceeds satisfactorily for the first week, and then begins to be retarded, and the patient's further improvement is very slow. On the other hand, some recover slowly from the immediate effects of parturition, but having got through the first week without any serious complication, their improvement subsequently is every way favourable. I firmly believe that very many of the ailments arising out of childbed are the consequence of making too much or too early exertion; and hence of late years I have rather gone back to the old custom of keeping the patient in bed, or at all events restricting her to a horizontal posture till after the ninth day. There is very seldom anything to be gained by the patient's getting up before this time, and often much positive harm results from it. Special cases of course present themselves where the patient must be confined to the recumbent position for a much longer period, from delicacy or over-abundance of the lochia, or in order to prevent the recurrence of prolapse or of retroflexion of the uterus.]

What next comes under consideration, is the circumstance of retention and excretion. We have formerly observed, that in time of labour, before the head of the child is locked into the pelvis, if the woman has not had easy passage in

her belly that same day, the rectum and colon ought to be emptied by a glyster, which will assist the labour, prevent the disagreeable excretion of the fæces before the child's head, and enable the patient to remain two or three days after without the necessity of going to stool. However, should this precaution be neglected, and the patient very costive after delivery, we must beware of throwing up stimulating glysters, or administering strong cathartics, lest they should bring on too many loose stools, which, if they cannot be stopped, sometimes produce fatal consequence, by obstructing the perspiration and lochia, and exhausting the women, so as that she will die all of a sudden; a catastrophe which has frequently happened from this practice. Wherefore, if it be necessary to empty the intestines, we ought to prescribe nothing but emollient glysters, or some very gentle opener, such as manna, or *Elect. Lenitivum.* For the retention of urine that sometimes happens after labour, we have already proposed a remedy in Book II, chap. ii, sect. 4 (page 158).

[Retention of urine is more apt to follow first, or instrumental labours; but some patients require the use of the catheter after every lying-in. In passing this instrument after delivery I always do it by sight, and not by touch, as the parts are so swollen and tender; and here, as on every other occasion, I prefer placing the patient on her left side. I have tried different remedies for restoring the power of micturition, but, as before mentioned, I have found nothing so efficacious as the ergot of rye. I generally administer it in doses of thirty or forty drops of the fluid extract, with half a drachm of sweet spirits of nitre every four hours. It is well to remember that some patients cannot void their urine in the dorsal position, whilst others can only do so in a sitting posture. In these cases of retention following delivery there is no benefit to be gained by delaying the employment of the catheter (as is proper in cases of hysterical retention). I have seen it tried, but always with disadvantage, and at the expense of great distress to the patient. I have known a few cases where an over-distended state of the bladder was not suspected owing to the occasional involuntary discharge of small quantities of urine.

In one instance the hypogastric tumour formed by the bladder was supposed to be the uterus distended by coagula, and with difficulty I prevented the attendant from dilating the cervix (a fortnight after delivery), and removing the imaginary clots! Under the use of the catheter the tumour at once disappeared, but the tone of the bladder was not regained for some time, as it had been several days in this over-distended condition.]

But no excretion is of more consequence to the patient's recovery than a free perspiration; which is so absolutely necessary, that unless she has a moisture continually on the surface of her body for some days after the birth, she seldom recovers to advantage; her health, therefore, in a great measure depends upon her enjoying undisturbed repose, and a constant breathing sweat, which prevents a fever, by carrying off the tension, and assists the equal discharge of the lochia; and when these are obstructed, and a fever ensues with pain and restlessness, nothing relieves the patient so effectually as rest and profuse sweating, procured by opiates and sudorifics at the beginning of the complaints; yet these last must be more cautiously prescribed in excessive hot, than in cool weather.

The last of the non-naturals to be considered, are the passions of the mind, which also require particular attention. The patient's imagination must not be disturbed by the news of any extraordinary accident which may have happened to her family or friends; for such information has been known to carry off the labour-pains entirely, after they were begun, and the woman has sunk under her dejection of spirits; and, even after delivery, these unseasonable communications have produced such an anxiety as obstructed all the necessary excretions, and brought on a violent fever and convulsions, that ended in death.

[I agree with our author that moderate perspiration has a very beneficial influence on the patient's convalescence, and I always like to feel a little moisture on the skin during the first few days of child-

bed. To promote this gentle perspiration I usually prescribe a diaphoretic mixture, to be taken at short intervals.

He gives a very proper caution against the administration of strong cathartics after delivery. If the bowels be well cleared out, as he recommends, during the labour, there will rarely be need of purgative medicine till the third or fourth day of childbed, and then it should be of a mild kind, assisted, if necessary, by an enema, which is better than giving a strong aperient, which may act too powerfully. In the absence of any special reasons to the contrary, I am strongly in favour of freely admitting air and light to the patient's chamber. It is hard to get nurses to do this, and I know it requires some judgment to do it safely. The importance of mental quietude and repose during the puerperal state cannot be over-estimated. Extreme excitement or the opposite state of depression may not only produce disturbance of the nervous system (of which mania or convulsions may be regarded as the highest development), but may also actually produce puerperal fever of one kind or another. Of this there can be no doubt; examples of it have come under my own observation in hospital and private practice. This is one reason why the dangers of childbed fall so heavily upon seduced women. Of the patients confined in the Dublin Lying-in Hospital during the period of my mastership (1854 to 1861), 127 belonged to this unfortunate class of females, and thirty-one, or very nearly one fourth of the entire number, died in childbed. It is true all, or nearly all these, were primiparous women; but yet the rate of mortality among them was *six times greater* than it was among the married primiparæ confined in hospital during the very same period.]

Sect. 3.—*Of violent Floodings, post-partum.*

All women, when the placenta separates, and after it is delivered, lose more or less red blood, from the quantity of half a pound to that of one pound or even two; but should it exceed this proportion, and continue to flow without diminution, the patient is in great danger of her life. This hazardous hæmorrhagy is known by the violence of the discharge, wetting fresh cloths as fast as they can be applied; from the pulse becoming low and weak, and the

countenance turning pale; then the extremities grow cold; she sinks into faintings; and, if the discharge is not speedily stopped or diminished, is seized with convulsions, which often terminate in death.

This dangerous efflux is occasioned by everything that hinders the emptied uterus from eontracting; sueh as great weakness and lassitude, in consequence of repeated floodings before delivery; the sudden evacuation of the uterus; sometimes, though seldom, it proceeds from part of the placenta's being left in the womb; it may happen when there is another child or more still undelivered; when the womb is kept distended with a large quantity of coagulated blood; or when it is inverted by pulling too forcibly at the placenta. See Book II, chap. iii, sect. 2 (page 165).

In this ease, as there is no time to be lost, and internal medicines cannot act so suddenly as to answer the purpose, we must have immediate recourse to external application. If the disorder be owing to weakness, by which the uterus is disabled from eontracting itself, so that the mouths of the vessels are left open; or though contracted a little, yet not enough to restrain the hæmorrhagy of the thin blood; or if, in separating the placenta, the accoueheur has scratched or tore the inner surface or membrane of the womb; in these cases, such things must be used as will assist the eontractile power of the uterus, and hinder the blood from flowing so fast into it and the neighbouring vessels; for this purpose, cloths dipped in any cold astringent fluid, such as oxycrate, or red tart wine, may be applied to the back and belly. Some prescribe venæsection in the arm, to the amount of five or six ounces, with a view of making revulsion; if the pulse is strong, this may be proper; otherwise, it will do more harm than good. Others order ligatures, for compressing the returning veins at the hams, arms, and neck, to retain as much blood as possible in the

extremities and head. Besides these applications, the vagina may be filled with tow or linen rags dipped in the above-mentioned liquids, in which a little alum or saccharum saturni has been dissolved; nay, some practitioners inject proof-spirits warmed, or, soaking them up in a rag or sponge, introduce and squeeze them into the uterus, in order to constringe the vessels.

If the floodings proceed from another child, the retention of the placenta, or coagulated blood, these ought immediately to be extracted, and if there is an inversion of the uterus it must be speedily reduced. Should the hæmorrhage by these methods abate a little, but still continue to flow, though not in such a quantity as to bring on sudden death, some red wine and jelly ought to be prescribed for the patient, who should take it frequently and a little at a time; but above all things, chicken or mutton broths, administered in the same manner, for fear of overloading the weakened stomach, and occasioning retchings; these, repeated in small quantities, will gradually fill the exhausted vessels and keep up the circulation. If the pulse continues strong it will be proper to order repeated draughts of barley-water, acidulated with elixir of vitriol; but if the circulation be weak and languid, extract of the bark, dissolved in *Aq. Cinnamoni tenuis*, and given in small draughts, or exhibited in any other form, will be serviceable, at the same time lulling the patient to rest with opiates. These, indeed, when the first violence of the flooding is abated, if properly and cautiously used, are generally more effectual than any other medicine.

[Before speaking of the treatment of *post-partum* hæmorrhage, let me make some observations upon its prophylaxis. This is a subject on which our author gives no information, except what he says in the remarks upon cases 474 and 475, where he speaks strongly in favour of giving a small opiate in the time of labour, which he "had found from experience to be the best method to secure the patient from being attacked by such fatal discharges."

There are certainly two, and probably three, conditions which influence the production of hæmorrhage after delivery; one of these, and by far the most important, is the muscular contractility of the womb. Another is the state of the circulation at the time of delivery. The more free the patient is from vascular excitement, the less firm need be the amount, or degree, of contraction of the uterus that will suffice to resist the escape of blood from the utero-placental vessels. This must be self-evident. A third condition there is, whose influence must not be altogether ignored, and that is the coagulable power of the blood itself. This property, I fully believe, plays some part, though probably a subordinate one, in arresting sanguineous discharges from the womb after labour, as well as at other times.

Vascular excitement towards the end of gestation and during labour, always forebodes hæmorrhage. Madame La Chapelle seems to have been aware of this, but the author who lays most stress upon it, and has most ably pointed out and illustrated its influence, is Gooch. Hæmorrhage after delivery, attributable to this cause, Gooch describes as "a peculiar form of hæmorrhage;" but the correctness of this title may justly be questioned.

I confess I always feel uncomfortable when I find the pulse permanently rapid and jerking towards the end of labour, especially if the uterine action be wanting in strength; and under such circumstances I endeavour, as far as time will permit, to adopt precautions against hæmorrhage, and to have every available recourse in readiness to suppress it. I very well remember the late Dr. Labatt, a man of great experience and sagacity, impressing on me the importance of attending to this symptom after delivery. He said that whenever he found the pulse to range above 100 at this critical period, it led him to look out for flooding or convulsions, and to be in no hurry leaving the patient's house.

It very seldom happens that we can foretell, during gestation, that the uterine contractions will be inefficient, except by the experience of the woman's past labours. The presence of any tumour in the uterus, however, might lead us to fear this result, and I have published a case of this kind where fatal hæmorrhage succeeded to delivery.[1] In like manner, unusual distension of the uterus from plurality of fœtuses, or from dropsy of the amnios, might awaken

[1] 'Clinical Memoirs on Diseases of Women,' p. 116.

an apprehension in our minds that hæmorrhage *post-partum* would be apt to take place. Levret held precisely the same opinion, for he says that, on all occasions when we see a patient extremely large, we must carefully guard against a too rapid delivery; and he points out very clearly and distinctly how a sudden emptying of the uterus —as when the child and waters are discharged at the same time— favours the production of hæmorrhage.

In the progress of labour, and especially in the second stage, the character of the pains affords a very reliable indication as to the probability of hæmorrhage. This every accoucheur of any experience must have observed. Both Dr. Whittle and Dr. Atthill pointedly allude to this premonitory symptom. "The pains," writes Dr. Whittle, "are of this kind—they are strong and quick; they do not gradually culminate into a strong pain, and subside again, but they are sharp, quick, and cease almost suddenly; and the intervals between the pains are long in proportion to the length of the pains."[1] In a subsequent communication he tells us that the above description was not intended for cases in which the uterus had become exhausted by prolonged labour, nor does he think the same mode of treatment would be at all applicable to the two cases. I have frequently had occasion to observe that extreme mental depression (whatever may be its cause) can exert a paralyzing influence upon the uterus. The free administration of chloroform, too, very often does the same, but not always; whilst there certainly are some women in whom this anæsthetic has quite the opposite effect: these latter patients, I have remarked, are keenly susceptible to pain of any kind, and the intense terror and agitation which the labour pains create in their minds prove a psychological cause of derangement in the function of the uterus (analogous to what may occur with regard to the functions of other organs of the body). Except in these special cases, however, I would not use chloroform in any instance where there was reason to dread the occurrence of flooding.

It must be admitted that not a few cases of *post-partum* flooding present themselves without any warning whatsoever, and where consequently we could not have anticipated it unless by the experience of the woman's previous labours. If flooding followed delivery in any former confinement, it should then be our duty to adopt precautionary measures against it, and be prepared to meet it.

[1] 'Brit. Med. Jour.,' 27th Sept., 1873.

The prophylaetic measures against *post-partum* hæmorrhage are based on the principles I have pointed out. It is always desirable that the circulation should be not only free from excitement, but, moreover, not in an excitable state when labour comes on. "That disturbance of the circulation," writes Mr. Roberton, "plays an important part in uterine hæmorrhage, and that it consequently deserves the especial attention of practitioners, is most true." In cases where the history of the patient's previous labours leads us to apprehend flooding, attention to the pulse is of paramount importance. To secure the desiderated quietude of the vascular system, all that is required in ordinary cases is open-air exercise, abstinence from stimulants, and regularity of the bowels; in addition to these means we might give digitalis and cooling medicines; and in full plethoric persons, I have no doubt the abstraction of blood from the arm, as recommended very strongly by La Chapelle (and at one time commonly resorted to in the management of pregnancy), would be very serviceable. To Dr. Gooch belongs the merit of directing the special attention of practitioners to the important part which the circulation plays in the production of *post-partum* flooding, but I long ago expressed doubts of the propriety of styling the hæmorrhage where this symptom is prominent "a peculiar form of hæmorrhage,"[1] as it does not differ essentially from hæmorrhage the result of simple atony of the uterus, and once it sets in, is to be treated on the same principles. His observations in regard to the pulse are well deserving of attention: "I advise them (practitioners) when they meet with patients subject to hæmorrhage after delivery, to notice the state of the circulation before labour, and if disturbed, to employ means for tranquillizing it before labour comes on. I advise them during labour to use cordials cautiously, lest the placenta should separate during an excited state of the circulation. I advise them after delivery, though the uterus may feel contracted, to be slow to leave their patient if the circulation is greatly disturbed." (*op. cit.*)

We occasionally meet with pregnant patients in whom rapidity of the circulation depends on causes quite the opposite of plethora or over sanguification. Here a line of treatment, totally differing from that above described, must be pursued.

Where the premonitory symptoms, or the result of previous labours, furnish grounds for expecting hæmorrhage, there are two

[1] M'Clintock and Hardy's 'Midwifery,' p. 217.

means which should be employed in addition to the slow extraction of the fœtus, and following down of the uterus with the hand, &c. These two are, letting off the liquor amnii by artificial rupture of the membranes, and the administration of ergot of rye. That the discharge of the waters early in the second stage increases the energy of the pains, and favours the tonic contraction of the uterus after its contents have been expelled, not only coincides with every-day experience, but is in accordance with a well-established law of uterine contraction, viz. that to be permanent and enduring it must be gradual. The principle, then, on which this practice rests, is perfectly clear and rational, and the practice itself has been recommended by many obstetric writers, some of them of the highest eminence. Both the principle, and the practice deduced from it, were clearly and fully described by Levret over 115 years ago. Dr. Robert Lee, in his Lectures upon Midwifery, published in 1839 (in 'London Medical Gazette'), very strongly advocates rupturing the membranes early in labour where we have reason to fear *post-partum* hæmorrhage, and and he narrates some striking examples of the good effects of the measure. The time to select for this puncture of the membranes is when the os is nearly fully dilated—the presentation, of course, being known to be a head or pelvic extremity. It is important for the success of the measure that the waters drain off, and to aid in this object it may be requisite, as Lee points out, to push up the presentation during a pain.

Where hæmorrhage after delivery is threatened, Levret advises the patient to be restricted to a lying posture from the beginning of the labour, in order, as he says, to guard against acceleration of the process; but another advantage from this precaution, which Dr. Dewees pointed out, is that it tends to keep the circulation more tranquil. Denman gives quite the opposite advice. He writes:—"When from former events there is reason to be apprehensive of hæmorrhage subsequent to the exclusion of the placenta, that has been altogether prevented, or very much lessened by delaying the time of the patient's going to her bed till the child was upon the point of being born, or even suffering it to be born while the woman sat upon the lap of one of her attendants." Great though my respect is for the authority of Denman, still I must candidly admit he leaves himself open to the severe but just criticism which Dr. Dewees pronounces on this piece of advice:—"Now," Dr. Dewees writes, "we would ask any one at all conversant with the

economy of the uterus during and after labour, how an erect position, and the sudden evacuation of the waters at the moment the child was about to be born, can possibly contribute to the only circumstance at all available in the case under consideration—namely, the permanent contraction of the uterus? In the first place, an erect position will always be attended with a quicker circulation than a recumbent one, it will permit the waters to escape with more suddenness and rapidity than a horizontal, and, consequently, the risk of atony must be increased."

I have adopted the precaution of rupturing the membranes on very many occasions, and am fully persuaded it is a most valuable, and always a feasible, auxiliary in the prevention of flooding after delivery; and Dr. Dewees, "from many years of experience," was convinced it is the principal means to be relied on for preventing hæmorrhage.

Of all the resources, however, against *post-partum* flooding, I believe the most effectual to be ergot of rye. The possibility of the ergot exerting some hurtful influence on the child need not deter us from its employment in these cases, for if the ergot fail to excite uterine contractions, the child will most assuredly be no way influenced by it[1], and if the drug produce the desired effect on the uterine muscles, delivery will in most cases take place before danger can arise to the child—and if not, we have the alternative measure of the forceps, which can be safely resorted to.

Who first employed ergot for the purpose of averting hæmorrhage, I cannot say. It seems highly probable that, soon after the peculiar properties of the drug became known to accoucheurs, it would be so used. I find Dr. Dewees gave it with this intention in a case related in the fourth edition of his 'Midwifery,' published in the year 1830.

When I was assistant to Dr. Charles Johnson, at the Lying-in Hospital, I frequently saw ergot given as a preventive of hæmorrhage. It used to be administered at one of three periods, viz. when the head was on the perincum, or immediately after it had cleared the vulva, or after the expulsion of the fœtus, and as soon as the insertion of the cord into the placenta could be felt.

"By giving ergot before the child has been expelled," writes Dr.

[1] That the action of ergot on the fœtus is purely mechanical and not physiological, I have endeavoured to show in a paper published in 'Dub. Quart. Jour.,' May, 1865, p. 484.

Hardy,[1] "some time may be gained; but, should the placenta be morbidly adherent, the difficulty of introducing the hand for its removal will be greatly increased. By adopting the third plan this source of apprehension is avoided. To this method it may be objected that much time will, perhaps, elapse, and a considerable quantity of blood be lost, before the ergot is administered; nevertheless, the possibility of the placenta being morbidly adherent should be ever present in the mind of the practitioner, and deter him from resorting to a measure which may so greatly augment the danger of the complication." Thus wrote Dr. Hardy in 1845, and the opinions therein expressed I held in common with him. But all my later experience has convinced me that, to be of real service, the ergot must be given some little time before delivery, and also that the objection he advances against this mode is practically of no weight, inasmuch as morbid adhesion of the placenta is so very rare an occurrence. Dr. Whittle's plan is to administer, as soon as the os uteri is fully dilated, a full dose (that is, one teaspoonful) of a liquid extract of ergot twice the strength of that of the Pharmacopœia. This is exactly equivalent in strength to what I myself give, viz. two drachms of the liquid extract of the British Pharmacopœia—a preparation I have used for some years back to the exclusion of all others, and which very seldom fails to produce the specific effects of the medicine on the uterus. In dealing with primiparæ, Dr. Whittle very properly cautions us not to administer ergot until the soft parts are pretty well dilated, as well as the os uteri, and to give the drug in much smaller doses, as it sometimes acts with unusual energy in primiparous women.

In cases of apprehended flooding, whilst it is most important to maintain a moderate compression of the uterus with the hand, it is, at the same time, desirable that we should not be in any hurry to press off the placenta, but wait for ten or twenty minutes, so as to give the uterus time to recover from the strong efforts required to propel the fœtus into the world. Should hæmorrhage come on in the meantime this rule may have to be departed from.

Dr. Atthill seems to avow himself an advocate for the forceps in preference to ergot as a means of averting hæmorrhage. Every one must admit that a patient will be less liable to flooding if delivered before her system is exhausted and the muscular irritability of the uterus worn out; but in the present day there is little danger of this

[1] 'Dub. Quarterly Journal,' May, 1845.

happening, as the forceps is so frequently and so promptly resorted to in the management of labours, that any additional incentive to its early employment is assuredly quite superfluous. In point of fact it is not after tedious labours that hæmorrhage is most apt to occur, but rather in those where there is little resistance to the expulsion of the child, and where, consequently, the second stage is brief in duration. The short, inert pains, which prognosticate hæmorrhage, arise from what we may call idiopathic atony of the womb; and here the use of the forceps, without previous stimulation of the uterus, would be directly calculated to induce the very danger we would avert; whereas, if we stimulate the torpid uterus first (by rupturing the membranes and by ergot), there will rarely be any need for a subsequent recourse to the "iron hand."

I have hinted that some deficiency in the coagulating property of the blood might probably be a predisposing cause of *post-partum* flooding. On this principle, whether it be correct or not, I have sometimes given gallic acid for days or weeks previously to the setting in of labour, and have reason to think well of the practice. In the same way, I think, we are to explain the good effects which Dr. Bassett (of Birmingham) attributes to a course of iron. He writes ('Brit. Med. Jour.,' 22nd November, 1873): "After an active experience, extending over five-and-twenty years, and a very careful examination of all the circumstances surrounding *post-partum* hæmorrhage, I have arrived at the conclusion that the best method of anticipating it is to prepare the patient for her confinement by a course of medical treatment extending over a period of from four to six weeks, the basis of such treatment being the administration of iron."

In the way of preventive treatment of this kind Denman says that, in those who have suffered from hæmorrhage in their former labours, he "has recommended their taking some tonic medicine, as one grain of zincum vitriolatum two or three times a day for several weeks before the time of their delivery, and the use of the cold bath throughout the latter period of pregnancy, even to the day of their delivery."

That an opiate given in the latter end of labour may in some cases help to avert flooding, as stated by our author, I can well believe; but there are other remedies more active and more efficacious, and, consequently, more to be depended on for this purpose.

The treatment of *post-partum* hæmorrhage is truly a wide subject.

Smellie's remarks upon it are sound and judicious, so far as they go, but beyond the use of cold and emptying of the uterus his therapeutic resources do not extend. It is not invariably true that all women, as he states, lose half a pound of blood or upwards at the time of delivery. I have met with some few cases, and so have other practitioners, where there was absolutely no loss—scarcely an appearance of bloody discharge until the lochia came on. I am disposed to think that a larger loss can be borne with impunity immediately on the birth of the child than at any later period. Experience has led me to make this observation, and the fact may, perhaps, be accounted for by the blood not coming so directly from the general circulation just after the exclusion of the fœtus, but rather from the uterine sinuses.

The recognition of hæmorrhage is easy enough; there are two ways, however, in which bleeding may go on, and yet the attendant overlook it, viz. when the hæmorrhage is internal; and when the blood escapes anteriorly (the patient lying on left side), and runs down in front and not behind. If hæmorrhage come on before the expulsion of the placenta much time should not be lost in attempting its removal by pressure or traction on the cord. If a reasonable trial of these fail to bring it into the vagina, then the best and safest course is to pass up the hand and extract it *secundum artem*. By delaying this proceedure more blood is lost, and irregular contraction of the cervix very apt to be induced by the tentative efforts to remove the afterbirth. When properly performed this operation generally arrests the hæmorrhage at once, and permanently.

Smellie says nothing about compression of the uterus as a means of exciting its contraction. Who first pointed out the value of this manipulation I cannot positively say, but have reason to believe it was Dusé, about the year 1722. This excellent measure, so efficient in restraining hæmorrhage, is liable to abuse, and thus may prove hurtful instead of beneficial; a caution is, therefore, necessary. If the uterus feel tolerably well contracted, and the flow of blood be arrested, further kneading and squeezing of it may only have the effect of provoking the hæmorrhage afresh, by disturbing the coagula at the mouths of the utero-placental vessels. I am sure I have often seen hæmorrhage kept up by this prolonged and injudicious compression.

If there be any perceptible fulness of the bladder when flooding occurs I always draw off the urine; this done, we can better

grasp the uterus, and apply cold to the hypogastrium with more effect.

The administration of ergot is a proper thing to do, and as soon as possible, in these cases of *post-partum* flooding; but, inasmuch as the medicine requires time—fifteen to thirty minutes—before it can be expected to produce any effect, we are not to depend on its action, or omit any other measures for suppressing the discharge.

Brandy is much relied on by some practitioners for stimulating the uterus, and Dr. Gream was in the habit of giving it freely for this purpose. If the patient be weak or exhausted, no doubt it is an indispensable auxiliary, but I do not believe it possesses any direct or special influence on the uterus. Cold water should never be poured on the abdomen, as recommended by some authors; there are obvious and cogent objections to this practice, and the cold can be applied in other equally efficacious ways, viz. injection to rectum, vagina, or uterus; wet napkin to vulva and to the hypogastrium. If ice be at hand it is very serviceable, and a piece may be passed high up into the vagina. In cases where there is reason to apprehend the occurrence of hæmorrhage a supply of ice should be provided. Cold, like any other powerful remedy, may be pushed too far; and when its use has been continued for some time, so that its renewed application produces no shock, and the temperature of the parts is much reduced, the suggestion of Baudelocque to apply hot cloths has often seemed productive of benefit.

Smellie speaks rather approvingly of filling the vagina with tow dipped in oxycrate (vinegar), alum water, or red wine. Now, although I have sometimes found advantage from thrusting the corner of a napkin dipped in vinegar into the vagina, and leaving it there for a few minutes, yet this is essentially different from plugging the vagina. This latter is a remedy never to be used in *post-partum* hæmorrhage arising from atony of the uterus. Nevertheless, there are two forms of primary hæmorrhage after delivery, in which the plug would be a most fitting remedy, namely, where the loss is consequent upon laceration of the cervix (a cause of hæmorrhage known to Smellie, as we learn from Case 334), or upon laceration of the vaginal orifice. Barnes suspects that the former of these is the true explanation of that variety of hæmorrhage which Gooch described under the name of "a peculiar form," &c.; and many of the cases considered to be such were in reality, I have no doubt,

examples of hæmorrhage from laceration of the cervix, or of the orifice of the vagina, especially if engaging one of the crura of the clitoris. That this latter variety of laceration may give rise to dangerous bleeding is attested by the fact that four fatal cases of such are on record, one by Poppel and three by Müller. Dr. Arthur Macan has drawn attention to this source of *post-partum* hæmorrhage in a communication to the 'Dublin Medical Journal' for November, 1875, p. 448, from which I extract the following observations on the diagnosis and treatment:—"Careful inspection will always reveal its source, and our diagnosis will be assisted by the hæmorrhage following immediately on the birth of the child and continuing after the expulsion of the placenta, though the uterus be hard and well contracted. The blood is also usually of a more florid colour than that in ordinary *post-partum* hæmorrhage. Sometimes the blood escapes in jets; more frequently it oozes out of the cavernous tissue like out of a sponge. If not very violent it may be stopped by a stream of cold water. If this fails we should dip a small compress of lint in a solution of perchloride of iron, and apply it to the source of the hæmorrhage, at the same time bringing the woman's thighs close together. In some cases a pin and ligature may be necessary." I have met with two or three examples of this kind of hæmorrhage, and in one of them the loss was very considerable before I saw the patient; but, having discovered its true source, I succeeded in arresting it by cold and pressure.

When ordinary excitants fail to induce the requisite degree of uterine action, and the flooding continues, we have a choice left us, as a last alternative, of introducing the hand, or injecting the perchloride of iron, as recommended by Barnes, and used so successfully by him and other practitioners. The introduction of the hand is no doubt a powerful stimulus to the uterus, and was much resorted to by Collins; Robert Lee, however, has written strongly against it. For the success of the iron injection the uterus should be clear of coagula, and we can be sure of this only by introducing the hand; if this suffice to provoke the requisite action of the womb we need not then resort to the other. After the perchloride has been used, it is somewhat difficult to pass in the hand. After using the iron, careful daily injection, with Condy's solution, should be made to lessen the risk of septicæmia. Although I have seen two cases where the perchloride injection completely failed to stop the hæmorrhage—both patients bleeding to death,—

still I regard it as a most powerful agent for the suppression of *post-partum* hæmorrhage.

Dr. Trask, of New York, has drawn attention to the use of solution of iodine (one part of the tincture to two parts of water), injected into the uterus, as a safe and powerful excitant of dormant reflex action, as well as being strongly antiseptic. Dr. Trask's very interesting paper was published in the 'Journal of Obstetrics' for January, 1875, and well deserves a careful perusal, especially of those who entertain objections to the safety of the perchloride injection on account of its powerfully coagulating property. Although the clinical data contained in his paper are not sufficient to warrant our speaking positively of the value of iodine,—and he himself disavows claiming for it a superiority over iron,—yet they encourage us to make further trial of it in these cases, and they justify the expectation that it will prove a valuable addition to our list of hæmostatics in *post-partum hæmorrhage*.

When the flow of blood has been checked, but the prostration is so great as to excite fears for the life of the patient, every available means must be assiduously, judiciously, and unremittingly used to bring about reaction, viz. stimulants by mouth and rectum; external warmth; attention to posture of body so as to keep the head very low and the pelvis raised; and moderate opiates as recommended by our author: these are the main points to attend to. If these fail us transfusion will suggest itself. But in truth the results of Dr. Braxton Hicks' large experience of the operation, performed with the utmost skill and judgment, strongly negative its claim to confidence; besides, the dangers and difficulties of its due performance constitute a serious objection to our employing it except in very rare and favoured circumstances.

The hypodermic injection of sulphuric ether is likely to render important service in the class of cases for which transfusion has been recommended; and the very instructive case recorded by Dr. Arthur Macan ('Dublin Medical Journal,' May, 1876), encourages the expectation that ether used in this way may prove a remedy of singular value, not only in the collapse following *post-partum* hæmorrhage, but in many other cases of what we may call acute exhaustion.

Examples of different varieties of *post-partum* hæmorrhage will be found among the cases recorded by Smellie. Thus in cases 474 and 475 (the latter fatal), the flooding was of the ordinary kind, de-

pending on uterine atony. In Case 334 the hæmorrhage occurred some hours after delivery, an instance of what Mr. Roberton and I ventured to designate "secondary hæmorrhage." Cases 488 and 489 show hæmorrhage resulting from acute inversion of the womb. Smellie himself would appear to have seen only one such case, which ended fatally before he reached the woman. He found the uterus inverted; pulled quite beyond the external parts, and the placenta adhering firmly to the fundus. "This misfortune," he adds, "was occasioned by the midwife's pulling at the placenta with too great force." I long entertained the idea that such was in every case the cause of the displacement. But the writings of Tyler Smith, and of others tended to shake my belief in this doctrine, and to show that inversion may, in some exceptional cases at all events, be produced by causes operating *ab intra*. This my later experience corroborates. Within the last few years two cases came under my observation, attended by practitioners of experience and trustworthy accuracy, where the inversion of the uterus was a purely spontaneous, self-produced act.]

Sect. 4.—*Of the After-pains.*

After-pains commonly happen when the fibrous part of the blood is retained in the uterus or vagina, and formed into large clots, which are detained by the sudden contraction of the os internum and externum after the placenta is delivered; or if these should be extracted others will sometimes be formed, though not so large as the first, because the cavity of the womb is continually diminishing after the birth. The uterus, in contracting, presses down these coagulums to the os internum, which being again gradually stretched produces a degree of labour pains, owing to the irritation of its nerves; in consequence of this uneasiness the woman squeezes the womb as in real labour; the force being increased, the clots are pushed along, and when they are delivered she grows easy. The larger the quantity is of the coagulated blood, the severer are the pains, and the longer they continue.

Women in the first child, seldom have after-pains; because, after delivery, the womb is supposed to contract, and push off the clots with greater force in the first than in the following labours; after-pains may also proceed from obstructions in the vessels, and irritations at the os internum. In order to prevent or remove these pains, as soon as the placenta is separated and delivered, the hand being introduced into the uterus, may clear off all the coagula. When the womb is felt, through the parietes of the abdomen, larger than usual, it may be taken for granted that there is either another child, or a large quantity of this clotted blood; and whichsoever it may be, there is a necessity for its being extracted. If the placenta comes away of itself, and the after-pains are violent, they must be alleviated and carried off by an opiate; for, by sleeping and sweating plentifully, the irritation is removed, the evacuations are increased, the os uteri is insensibly relaxed, and the coagula slide easily along. When the discharge of the lochia is small, the after-pains, if moderate, ought not to be restrained; because the squeezing which they occasion, promotes the other evacuation, which is necessary for the recovery of the patient. After-pains may also proceed from an obstruction in some of the vessels, occasioning a small inflammation of the os internum and ligaments; and the squeezing thereby occasioned may not only help to propel the obstructing fluid, but also (if not too violent) contribute to the natural discharges.

[That the retention of coagula is the cause of after-pains has been laid down by Smellie, and nearly every subsequent writer upon obstetrics, and no doubt it is generally true. But women who are prone to suffer from dysmenorrhœa, however slight, are more apt than others to be annoyed by these pains; and such women also are liable to them even after their first children. The reason for primiparous women enjoying an exemption from after-pains, is not by any means clear; and Smellie himself does not seem quite satisfied with

the explanation ordinarily given, viz. "because after delivery, the womb is supposed to contract, and pass off the clots with greater force in the first than in the following labours." On some rare occasions I have known cramps in the legs to have taken the place of after-pains, and to have been allayed by the remedies suitable for the latter. For the prevention of after-pains the late Sir Charles Locock relied a good deal upon careful manual compression of the uterus, after delivery, so as to expel any coagula.

Opium by the mouth, by the rectum, or applied externally to the hypogastric integument, is our sheet-anchor for subduing these troublesome sequelæ of labour. Ether, camphor, and chloral are very good adjuvants and tolerable substitutes in patients who cannot bear opium. A very effectual anodyne and hypnotic draught (to be given at bed-time) is one composed of twenty-five minims of solution of muriate of morphia, a drachm and a half, or two drachms, of syrup of chloral, ten minims of spirit of chloroform, and an ounce of cinnamon water. The solution of bi-meconate of morphia, recommended by Mr. Squire, will often be tolerated when other preparations of the same drug disagree. In "stubborn cases of after-pains," Dr. William Goodell, acting on the suggestion of Dr. Fordyce Barker, has found nothing to act so promptly as the exhibition of ten grains of quinia every six hours, until the ears ring (American Supplement to 'Obstetric Journal of Great Britain and Ireland,' for July and August, 1874). In the cases in which Dr. Barker has derived benefit from quinine he regards the after-pains as being "purely neuralgic in their character. There is no distension or tenderness of the abdomen, nor is the uterus enlarged. On the contrary, it is very firm but quite sensitive on pressure. There is an entire absence of other symptoms, such as febrile reaction and constitutional disturbance, which attend inflammation of the pelvic organs. These neuralgic pains do not yield to opiates in the fullest dose; but within a few years past I have treated them successfully by quinine internally, and the application of chloroform liniment externally." ('On Puerperal Diseases,' p. 8.) Cases answering this description I have occasionally met with, and looked upon as examples of hysteralgia; and opium endermically applied I found of more service than when given by the mouth; but the quinine treatment I have not yet put in practice. Several patients have come under my care whose habit it was not to experience after-pains till the third, fourth, or fifth day of childbed, and then to

have them pretty severely, especially when the child was put to the breast.

From a review of all the facts I have mentioned about after-pains, I am strongly disposed to think that the mechanical or clot theory is quite inadequate to explain all their phenomena, and that there is some other element or factor which co-operates in their production. That the presence of coagula in the uterine cavity frequently proves an *exciting* cause of the pains, I freely admit; but that there is also a deeper and more influential cause, of a predisposing nature, I am forced by the evidence to believe. Whatever may be our views regarding their etiology, there is one practical fact never to be overlooked, and it is this: that severe after-pains, on the second or third day of childbed, may, if allowed to go on unchecked, run into actual inflammation; and again, that peritoneal inflammation sometimes sets in with *intermitting* pains closely resembling in their character true after-pains, insomuch that an unwary practitioner may mistake their nature, and let slip most precious moments for the employment of successful treatment.]

Sect. 5.—*Of the Lochia.*

We have already observed, that the delivery of the child and placenta is followed by an efflux of more or less blood, discharged from the uterus, which, by the immediate evacuation of the large vessels, is allowed to contract itself the more freely, without the danger of an inflammation, which would probably happen in the contraction, if the great vessels were not emptied at the same time; but as the fluids in the smaller vessels cannot be so soon evacuated or returned into the vena cava, it is necessary that, after the great discharge is abated, a slow and gradual evacuation should continue, until the womb shall be contracted to near the same size which it had before pregnancy; and to this it attains about the eighteenth or twentieth day after delivery, though the period is different in different women.

[It requires a much longer time than is here assigned, for the

uterus to reduce its bulk to what it had before pregnancy. Instead of three weeks, at least double this period must elapse before the organ returns to its normal size; and as this process of involution is often interrupted, so it is not uncommon to find the womb remaining unnaturally large for months after parturition. This sub-involution of the uterus (as Simpson very appropriately termed it), may follow upon a favourable convalescence; but without doubt it is more likely to supervene when any uterine or pelvic inflammation has complicated childbed.

It has often appeared to me that the uterus was larger, and certainly much higher out of the pelvis on the second or third day of childbed, than it was some hours after delivery; that whereas at the latter period the womb seemed so small, and at all events so sunk that its fundus could be felt but little above the plane of the brim; yet at a later period, the second or third day for instance, the entire organ had mounted up, so that it had the size and the position in the abdomen, of a uterus five months advanced in gestation. I am not aware of any obstetrician who has made this point the subject of special investigation, and as I myself have not done so, I can only give the results of casual, but oft-repeated clinical observation, in which I think I have not been misled or deceived. The apparent increase in the volume of the uterus at the second or third visit is due in great measure, I have no doubt, to its rising up out of the true pelvis; but even after making every fair allowance for this source of deception, I have met with cases where the uterus appeared to possess really a greater bulk on the second or third day, than it did on the first day. I cannot see very well how we are to reconcile this with the established doctrine, that the womb undergoes, from the time of delivery, a gradual, progressive diminution in its size under the combined influence of absorption, muscular contraction, fatty degeneration, and excretion. The *post-partum* enlargement of which I have been speaking, is quite a distinct and different thing from the enlargement which inflammatory, vascular turgescence produces, and which is so commonly met with in acute hysteritis, peritonitis, pelvic cellulitis, &c.]

When the large vessels are emptied immediately after delivery, the discharge frequently ceases for several hours, until the fluids in the smaller vessels are propelled into the larger, and then begins to flow again of a paler colour.

The red colour of the lochia commonly continues till the fifth day, though it is always turning more and more serous from the beginning; but, about the fifth day, it flows off a clear, or sometimes (though seldom) of a greenish tint; for the months of the vessels, growing gradually narrower by the contraction of the uterus, at last allow the serous part only to pass. As for the greenish hue, it is supposed to proceed from a dissolution of the cellular or cribriform membrane or mucus that surrounded the surface of the placenta and chorion; part of which, being left in the uterus, becomes livid, decays, and dissolving mixes with and tinctures the discharge as it passes along.

Though the lochia, as we have already observed, commonly continue to the eighteenth or twentieth day, they are every day diminishing in quantity, and soonest cease in those women who suckle their children, or have had an extraordinary discharge at first; but the colour, quantity, and duration, differ in different women; in some patients, the red colour disappears on the first or second day; and in others, though rarely, it continues more or less to the end of the month; the evacuation in some is very small, in others excessive; in one woman it ceases very soon; in another, flows during the whole month; yet all of these patients shall do well.

Some allege, that this discharge from the uterus is the same with that from a wound of a large surface. But it is more reasonable to suppose, that the change of colour and diminution of quantity proceed from the slow contraction of the vessels; because, previous to pus, there must have been lacerations or imposthumes; and in women who have suddenly died after delivery, no wound or excoriation hath appeared upon the inner surface of the womb, which is sometimes found altogether smooth, and at other times rough and unequal on that part to which the placenta adhered. The space that is occupied before delivery, from

being six inches in diameter, or eighteen inches in circumference, will, soon after the birth, be contracted to one third or fourth of these dimensions.

[The analogy between the interior of the uterus after delivery and the surface of a stump or large wound, was first instituted, I believe, by the immortal Harvey, and has been recognised by many writers since, especially by Van Swieten, Cruvielhier, and Fergusson. Dr. Matthews Duncan has very judiciously remarked that "the chief analogy of the internal uterine surface after delivery is not with a stump, so far as it consists of incised and denuded tissues, but only in both surfaces presenting numerous open veins liable to become inflamed, or to absorb the obnoxious materials which may be brought into contact with them." ('Researches in Obstetrics,' p. 215.) Smellie gives no support to this analogy; the little he does say is rather against it. Neither does he recognise pus as a normal constituent of the lochia: in this he is correct, and when pus is present it comes from some laceration or abrasion of the uterus or vagina. The quantity, colour, or duration of the lochia have little or no importance, as signs or indications of how the patient is progressing; such is Smellie's opinion, and it entirely accords with my own experience and with that of many other observers. Fetor of the lochia, however, is of far more importance, and should always engage our attention; and the great utility of antiseptic injections into the vagina after delivery is now pretty generally acknowledged. On this point of practice Charles White (of Manchester) seems to have been far in advance of his cotemporaries, and to have held views essentially similar to those entertained by some eminent men in our own day. "I must not omit to mention," he writes, "the good effects I have experienced from emollient or antiseptic injections into the uterus, by means of a large ivory syringe, or an elastic vegetable bottle. In those cases where the lochia have become acrid or putrid, and by being absorbed into the circulation have served as a constant fomes to the disease, I have by these means known the fever much assuaged, and in many cases wholly extinguished; for though, as I have before observed, the quantity of the lochia is not to be much regarded, the quality of this discharge is a matter of infinite importance." ('On Lying-in Women, &c.,' 5th edition, 1791, p. 223.) Elsewhere he insists upon the propriety of distinguishing between obstruction and absorption of the lochia,

the former being of little, but the latter of very great importance; and he ventures, with "a good deal of certainty, to conclude, that the absorption of matter is the immediate cause of the puerperal fever." (*Ibid.*, p. 384.) To prevent the lochia stagnating, and the risk of their consequent absorption, he strongly recommends the patient to be frequently raised to a sitting posture, in bed. The advice of Dr. Goodell for offensive lochia is quite in keeping with that of White, except that Dr. Goodell is not content with raising the trunk of the body, but "the woman is made to get out of bed and slip into a chair three or four times a day." (*op. cit.*)

It is very good practice, as a general rule, to have the vagina syringed, night and morning, during the early days of childbed, with a weak solution of the permanganate of potash. If the lochia be at all fetid, the carbolic acid, in a very diluted form, should be used for the vaginal injection, and directed into the cavity of the uterus.

In the next section (entitled Milk Fever) Smellie makes further and more extended remarks on the lochia, which I think should have been introduced into this section.]

Sect. 6.—*Of the Milk Fever.*

[In this section the author treats not only of milk fever, but also of the lochial discharge, its deviations in quantity, and its obstruction, together with the fever consequent upon this obstruction. It is plain that these latter remarks properly belong to the last section, but I did not feel justified in changing their place.]

About the fourth day, the breasts generally begin to grow turgid and painful. We have formerly observed, that during the time of uterine gestation the breasts in most women gradually increase till the delivery, growing softer as they are enlarged by the vessels being more and more filled with fluids; and by this gradual distention they are prepared for secreting the milk from the blood after delivery. During the two or three first days after parturition, especially when the woman has undergone a large discharge, the breasts have been sometimes observed to subside and grow

flaccid; and about the third or fourth day, when the lochia begin to decrease, the breasts swell again to their former size, and stretch more and more, until the milk being secreted, is either sucked by the child, or frequently of itself runs out at the nipples.

Most of the complaints incident to women after delivery proceed either from the obstruction of the lochia in the uterus, or of the milk in the breasts, occasioned by anything that will produce a fever; such as catching cold, long and severe labour, eating food that is hard of digestion, and drinking fluids that quicken the circulation of the blood in the large vessels; by which means the smaller, with all the secretory and excretory ducts, are obstructed.

[The idea that repression of the lochia or of the milk was the fruitful source of all the maladies incident to childbed, was a very old one, and continued to be received by obstetric authorities until after the time of Denman. That Smellie did not place implicit faith in this theory may be inferred, I think, from an observation of his prefixed to Case 451 :—"As there are seldom inflammations in the uterus without obstructions of the lochia, and seldom obstructions of the lochia, but there must be more or less of an inflammation of the uterus, they might be joined together." He only gives three cases (Nos. 479, 480, 481) specially to illustrate obstruction of the lochia, and none of these cases occurred in his own practice. It is curious he does not give any separate consideration to hysteritis, or peritonitis, following delivery; but in his clinical histories under the heading, "On Inflammations," he does give a series of cases (No. 446, *et seq.*) which are unquestionable examples of puerperal inflammation. Thus, it would seem that while formally recognising the prevalent theory respecting puerperal fever, yet that when he came to look at it from a purely clinical and practical point of view, he seemed to regard peritoneal or uterine inflammation as an idiopathic puerperal malady.

He nowhere uses the term "puerperal fever," although it had previously been applied to the complaint in question by Edward Strother, M.D., whose 'Criticon Febrium; or, Critical Essay on Fevers,' was published at London in 1718. This writer was probably the first who gave the name of "puerperal fever" to the disease.

I make this statement on the authority of Dr. Hulme, as I have never come across Strother's book. Dr. Hulme's 'Treatise on the Puerperal Fever' appeared in 1772. It contains an interesting chapter (v), giving a concise retrospect of the opinions held by eminent medical men, from Hippocrates down to Manning (1771), as to the cause and nature of puerperal fever. This chapter has been omitted from the reprint of Hulme's treatise, published along with other works on diseases of females, by the Sydenham Society, in the year 1849.

Scattered through Smellie's clinical histories we find several cases related where acute febrile symptoms supervened upon delivery and sometimes proved fatal. These are quite sufficient to show the not unfrequent occurrence of puerperal fever in his private practice, although it was entirely home attendance. That he should have met with so many cases of puerperal fever, is not any reflection on Smellie, —it was an unavoidable consequence of the large number of difficult and complicated cases falling under his care.]

The discharge of the lochia being so different in women of different constitutions, and besides in some measure depending upon the method of management and the way of life peculiar to the patient, we are not to judge of her situation from the colour, quantity, and duration of them, but from the other symptoms that attend the discharge; and if the woman seems hearty, and in a fair way of recovery, nothing ought to be done with a view to augment or diminish the evacuation. If the discharge be greater than she can bear, it will be attended with all the symptoms of inanition; but as the lochia seldom flow so violently as to destroy the patient of a sudden, she may be supported by a proper, nourishing diet, assisted with cordial and restorative medicines. Let her, for example, use broth, jellies, and asses' milk; if the pulse is languid and sunk, she may take repeated doses of the *Confec. Cardiac.* with mixtures composed of the cordial waters and volatile spirits. Subastringents and opiates frequently administered, with the *Cort. Peruv.* in different forms, and austere wines, are of

great service. On the other hand, when the discharge is too small, or hath ceased altogether, the symptoms are more dangerous, and require the contrary method of cure; for now the business is to remove a too great plenitude of the vessels in and about the uterus, occasioning tension, pain, and labour, in the circulating fluids; from whence proceed great heat in the part, restlessness, fever, a full hard quick pulse, pains in the head and back, nausea, and difficulty in breathing. These complaints, if not at first prevented, or removed by rest and plentiful sweating, must be treated with venæsection and the antiphlogistic method.

When the obstruction is recent, let the patient lie quiet and encourage a plentiful diaphoresis, by drinking frequently of warm, weak, diluting fluids; such as water-gruel, barley-water, tea, or weak chicken broth; she may likewise take opiates and sudorifics in different forms as may be agreeable to her stomach. *Theriaca Androm.* from ʒss to ʒj; *Laud. liquid.* from gut. x to gut. xx; *Pilul. saponac.* from gr. v to gr. x or *Syr. de Meconio* from ʒss to ʒj. These may be repeated occasionally, with other forms of opiates; and if they fail to procure rest and sweating, the following diaphoretics, without opium, ought to be administered:

℞ *Pulv. Contrayerv. Cam.* ʒss; *Pulv. Castor. Russ. Sal. Succin.* āā. gr. v; *Syr. Croci* q. s. f.; *Bolus statim sumendus cum haust. sequent. et repetat. quarta vel sexta quaque hora ad tres vices vel ut opus fuerit.*

℞ *Aq. Cinnamon. ten.* ʒiss *cum Spiritu Syr. Croci* āā ʒij; *adde Sal. vol. C. C.* gr. iv, m.

[Nearly all the medicines prescribed by our author are to be found in the 'Pharmacopœia of the Royal College of Physicians,' London, for 1721 or 1746. Most of the confections, electuaries, and theriacæ of these editions have no modern representatives (except in the French Codex) and are exceedingly complex farragos. Some of the preparations which are still retained have new names

which will be indicated when mention is made of them in the text. The "theriaca Andromachi" above prescribed is one of the obsolete preparations. It contained over sixty different ingredients, and was justly stigmatised by Dr. Paris as "the many-headed monster of pharmacy!" It was in truth a most heterogeneous compound, and on no principle of combination could its retention in the pharmacopœia be vindicated. Its chief effects would be those of a stimulant and carminative. The "Syr. de Meconio" was the same as our modern syrup of poppies.]

Should these methods be used without success, and the patient, far from being relieved by rest, plentiful sweating, or a sufficient discharge of the obstructed lochia, labour under a hot dry skin, anxiety, and a quick hard and full pulse, the warm diaphoretics must be laid aside; because if they fail of having the desired effect, they must necessarily increase the fever and obstruction, and recourse be had to bleeding at the arm or ankle, to more or less quantity, according to the degree of fever and obstruction; and this evacuation must be repeated as there is occasion. When the obstruction is not total, it is supposed more proper to bleed at the ankle than at the arm; and at this last when the discharge is altogether stopped. Her ordinary drink ought to be impregnated with nitre, and the following draughts or others of the same kind prescribed:

℞ *Sal. Absynth.* (Carb. Kali) ℈j; *Succ. Limon.* ʒss; *Aq. Cinnamon. simp.* ʒiss; *Pul. Contrayerv. Comp.* ℈j; *Sacch. Alb.* q. s. f.; *Haustus statim sumendus, et quarta vel sexta quaque hora repetendus.*

If she is costive, emollient and gently opening glysters may be occasionally injected; and her breasts must be fomented, and sucked either by the mouth or pipe-glasses. If by these means the fever is abated, and the necessary discharges return, the patient commonly recovers; but if the complaints continue, the antiphlogistic method must still be pursued. If notwithstanding these efforts the fever is not diminished or removed by a plentiful discharge of

the lochia from the uterus, the milk from the breasts, or by a critical evacuation by sweat, urine, or stool, and the woman is every now and then attacked with cold shiverings, an abscess or abscesses will probably be formed in the uterus or neighbouring parts, or in the breasts; and sometimes the matter will be translated to other situations, and the seat of it foretold from the parts being affected with violent pains; these abscesses are more or less dangerous, according to the place in which they happen, the largeness of the suppuration, and the good or bad constitution of the patient.

[The abscesses here mentioned as coming on in the course of the fever, leave no room for doubt as to the pyæmic character of the disease in the cases alluded to. Smellie seems, however, to regard the pus which forms in distant parts, as being but a metastasis, or translation, from an abscess in the uterus, or the breast. His prognosis of these formidable cases is less unfavourable than I would have made it.]

If, when the pains in the epigastric region are violent and the fever increased to a very high degree, the patient should all of a sudden enjoy a cessation from pain without any previous discharge or critical eruption, the physician may pronounce that a mortification is begun; especially if at the same time the pulse becomes low, quick, wavering, and intermitting; if the woman's countenance, from being florid, turns dusky and pale, while she herself and all the attendants conceive her much mended; in that case, she will grow delirious, and die in a very short time.

What we have said on this subject regards that fever which proceeds from the obstructed lochia, and in which the breasts may, likewise, be affected; but the milk-fever is that in which the breasts are originally concerned, and which may happen though the lochia continue to flow in sufficient quantity; nevertheless they mutually promote each other, and both are to be treated in the manner

already explained; namely, by opiates, diluents, and diaphoretics in the beginning; and these prescriptions failing, the obstructions must be resolved by the antiphlogistic method described above. The milk-fever alone, when the uterus is not concerned, is not so dangerous, and much more easily relieved. Women of a healthy constitution, who suckle their own children, have good nipples, and whose milk comes freely, are seldom or never subject to this disorder, which is more incident to those who do not give suck, and neglect to prevent the secretion in time, or, when the milk is secreted, take no measures for emptying their breasts. This fever likewise happens to women who try too soon to suckle, and continue their efforts too long at one time; by which means the nipples, and consequently the breasts, are often inflamed, swelled, and obstructed.

[Above, where he says, "the milk-fever alone, when the uterus is not concerned, is not so dangerous, and much more easily relieved," implies some recognition of the uterine element in many of the cases considered in his day to be instances of milk-fever. For my part I believe that many of the cases of rigor followed by pyrexia, coming on about the third, fourth, or fifth day of childbed, and which from being unattended by any marked uterine pain or tenderness, are commonly described under the euphemistic name of *weid*, or *milk-fever*, are really not milk-fever at all, but have a septicæmic origin. Extreme distension of the breast may cause some headache and febrile disturbance; these cases are rare, but in my judgment they are the only proper examples of true milk-fever. No doubt inflammation, however local or circumscribed, of the breasts is capable of giving rise to febrile symptoms, which may perhaps constitute a milk-fever. This inflammation is most commonly excited in the way Smellie describes, viz. by attempts at nursing too frequently and perseveringly repeated, whereby the nipple becomes irritated and inflamed, which inflammation spreads to the gland or its parenchyma, and too commonly runs on to the formation of abscess. I believe Smellie to be wrong in supposing that women who do not give suck are more liable to milk-fever or mammary inflammation; on the contrary, my experience almost in-

variably has been that those women who do not attempt nursing at all, entirely escape inflammation or abscess of the breast. This point is one of considerable practical importance, and has a direct bearing on the prevention of mammary abscess.][1]

In order to prevent too great a turgescency in the vessels of the breasts, and the secretion of milk, in those women who do not choose to suckle, it will be proper to make external application of those things which, by their pressure and repercussive force, will hinder the blood from flowing in too great quantity to this part, which is now more yielding than at any other time; for this purpose, let the breasts be covered with *Empl. de minio*, *Diapalma*, or *Empl. simp.* spread upon linen, or cloths dipped in camphorated spirits, be frequently applied to these parts and the arm-pits; while the patient's diet and drink are of the lightest kind, and given in small quantities. Notwithstanding these precautions, a turgescency commonly begins about the third day; but by rest, moderate sweating, and the use of these applications, the tension and pain will subside about the fifth or sixth day, especially if the milk runs out at the nipples; but if the woman catches cold, or is of a full habit of body, and not very abstemious, the tension and pain increasing, will bring on a cold shivering, succeeded by a fever; which may obstruct the other excretions, as well as those of the breast.

In this case, the sudorifics above recommended must be prescribed; and if a plentiful sweat ensues, the patient will be relieved; at the same time the milk must be extracted from her breasts by sucking with the mouth or glasses. Should these methods fail, and the fever increase, she ought to be blooded in the arm; and, instead of the external applications hitherto used, emollient liniments and cataplasms must be substituted, in order to soften and relax.

[1] At pp. 313 and 314 of my 'Clinical Memoirs on Diseases of Women,' I have considered this matter at some length.

If in spite of these endeavours the fever proceeds for some days, the patient is frequently relieved by critical sweats, a large discharge from the uterus, miliary eruptions, or loose stools mixed with milk, which is curdled in the intestines. But should none of these evacuations happen, and the inflammation continue with increasing violence, there is danger of an imposthume, which is to be brought to maturity, and managed like other inflammatory tumours; and no astringents ought to be applied, lest they should produce scirrhous swellings in the glands.

As the crisis of this fever, as well as of that last described, often consists in miliary eruptions over the whole surface of the body, but particularly on the neck and breasts, by which the fever is carried off, nothing ought to be given which will either greatly increase or diminish the circulating force, but such only as will keep out the eruptions. But if, notwithstanding these eruptions, the fever, instead of abating, is augmented, it will be necessary to diminish its force, and prevent its increase by those evacuations we have mentioned above. On the contrary, should the pulse sink, the eruptions begin to retreat inwardly, and the morbific matter be in danger of falling upon the viscera, we must endeavour to keep them out, by such opiates and sudorific medicines as we have already prescribed in obstructions of the lochia; and here blisters may be applied with success. On this subject Sir David Hamilton and Hoffman may be consulted.

Sect. 7.—*Of the Prolapsus Vaginæ, Recti, et Uteri.*

When the head of the child is long retained about the middle of the vagina, the lower part of that sheath sometimes swells; and, as the head comes farther down, is pushed out at the os externum, occasioning great difficulty in delivering the woman; sometimes also the lower part

of the rectum is protruded through the sphincter ani, especially if the patient is troubled with the inward piles. The cure of both these complaints consists in reducing the prolapsus; if this cannot be done immediately in the last on account of the swellings of the protruded part, emollient fomentations and poultiees must be used in order to remove the inflammation. When it is reduced, the woman must be confined more than usual to her bed; and if the part falls down again in eonsequence of her straining at stool or in making water, it must be reduced oceasionally, and as she recovers strength the eomplaint will in all probability vanish; otherwise astringent fumigations or fomentations must be used. If the disorder be of long duration, pessaries, adapted to the part, whether vagina or rectum, must be applied.

A prolapsus uteri may happen from the same causes, or from anything that will too much relax the ligament and peritoneum, by whieh the womb is suspended; sueh as an inveterate fluor albus, that, by its long continuance and great diseharge, weakens the womb and all the parts.

This misfortune, when it proceeds from labour, does not appear till after delivery, when the uterus is contracted to its smallest size; nay, not for several weeks or months after that period, until by its weight the os externum is gradually stretched wider and wider, so as to allow the womb to slip through it; and in this ease it deseends covered with the vagina, that comes down along with it, and hangs between the thighs; though the os tincæ only can be perceived on account of this covering, the shape and substance of the uterus may be easily distinguished.

As this prolapsus comes on gradually, the woman of herself ean (for the most part) reduee and keep it up while in bed; but when she rises and walks, it will fall down again. When the complaint is not of long standing, and the womb does not eome altogether through the os exter-

num, the patient may be cured by astringent injections; and in the next pregnancy, when the upper part of the uterus is distended so as to fill the pelvis and rise above its brim, the os internum will be raised higher in the vagina; and after delivery, if the woman is confined to her bed for twenty or thirty days, the ligaments generally contract so as to keep up the womb and prevent any future prolapsus. But when the complaint is of long continuance; when the uterus and vagina descend quite through the os externum, and by the friction in walking, occasioned by the vagina's rubbing against the thighs and the os uteri upon the cloths that are used for supporting it, an inflammation, excoriation, and ulceration, are produced, inviting a greater flux of fluids to the part; these symptoms, joined with a fluor albus from the inside of the uterus, destroy the hope of a second impregnation, or cure by injections; and we can only promise to palliate the disease, by reducing the uterus and keeping it up with a pessary; by which means, used for a length of time, the parts will recover their tone, and the disease be radically cured.

If the uterus be so much inflamed that it cannot be reduced, generally evacuations must be prescribed, and fomentations and poultices applied in order to diminish its bulk, so as that it may be replaced. For this complaint, different kinds of pessaries have been used; some of a globular form; others that open with a spring, as described in the Medical Essays of Edinburgh. But those most in use are of a flat form, with a little hole in the middle, and made of cork waxed over, ivory, box, ebony, lignum vitæ, of a triangular, quadrangular, oval, or circular shape. Those that are circular seem best to answer the intention, because we can more easily introduce a large one of that than of any other figure; it lies more commodiously in the vagina; and, as it always tilts a little upwards and downwards, never hinders the passage of the urine or fæces;

these instruments, however, ought to be larger or smaller, according to the laxity or rigidity of the os externum.

There is a pessary lately invented at Paris, which hath an advantage over all others; because the woman can introduce it in the morning, and take it out at night; it is supported and kept in the vagina by a small stalk, the lower end of which forms a little ball that moves in a socket; this socket is furnished with straps, which are tied to a belt that surrounds the patient's body. This pessary is extremely well calculated for those who are in an easy way of life; but the other kind is best adapted to hard-working women, who have not time or conveniency to fix or mend the bandage when it wants repair.

Sect. 8.—*Of the Evacuations necessary at the End of the Month after Delivery.*

Those who have had a sufficient discharge of the lochia, plenty of milk, and suckle their own children, commonly recover with ease; and, as the superfluous fluids of the body are drained off at the nipples, seldom require evacuations at the end of the month; but if there are any complaints from fulness, such as pains and stitches, after the twentieth day, some blood ought to be taken from the arm, and the belly gently opened by frequent glysters or repeated doses of laxative medicines.

If the patient has tolerably recovered, the milk having been at first sucked or discharged from the nipples, and afterwards discussed, no evacuations are necessary before the third or fourth week, and sometimes not till after the first flowing of the menses, which commonly happens about the fifth week; if they do not appear within that time, gentle evacuations must be prescribed to carry off the plethora and bring down the catamenia.

[The intelligent reader cannot fail to remark that Smellie's enumeration of "the several diseases" incident to childbed, does not contain *phlegmasia dolens*, *puerperal mania*, or *pelvic cellulitis*. These maladies were little known or understood when Smellie practised. Although phlegmasia dolens was noticed by Roderic a Castro in 1603, and subsequently by Mauriceau; yet, till the publication of the treatise of Puzos in 1759, the complaint was scarcely recognised by physicians, and very many years more elapsed before any correct idea of its pathology was gained, and even still a good deal remains to be cleared up. Pelvic abscesses, consequent upon childbed, were alluded to by Richard Wiseman, "Serjeant-chirurgeon to King Charles the Second;" and very many years after him by Puzos, though under a totally different designation. Who first pointed out the form of insanity which we call *puerperal*, I cannot pretend to say. Its distinct recognition as a true puerperal disease dates from about the time of Puzos, as he speaks of the milk being thrown on the brain, and hence arose the term mania *lactea*.

As these ailments do not generally arise till the second or third week of childbed, it is more than probable that in Smellie's day they fell under the care of the physician or surgeon, and consequently that Smellie may have come across very few instances of them.]

CHAPTER II.

OF THE MANAGEMENT OF NEW-BORN CHILDREN, WITH THE DISEASES TO WHICH THEY ARE SUBJECT.

SECT. I.—*Of Washing and Dressing the Child.*

THE child being delivered, the navel-string tied and cut, a warm cloth or flannel cap put on its head, and its body wrapped in a warm receiver, it may be given to the nurse or an assistant in order to be washed clean from that scurf which sometimes covers the whole scarf-skin, and is particularly found upon the hairy scalp under the arm-pits,

and in the groins. This ablution is commonly performed with warm water, mixed with a small quantity of Hungary water, wine, or ale, in which a little pomatum or fresh butter hath been dissolved. This composition cleans all the surface, and the oily part, by mixing with and attenuating the mucus, prepares it for the linen cloth, which dries and wipes off the whole; nevertheless, milk and water or soap and water is preferable to this mixture.

In laborious or preternatural cases, when considerable force hath been used in delivering the child, the whole body ought to be examined, and if there is any mark or contusion on the head it will disappear if anointed with pomatum and gently rubbed or chafed with the accoucheur's hand; if any limb is dislocated or broken it ought to be reduced immediately: luxations, though they seldom happen, are more incident to the shoulder than to any other part, the humerus being easily dislocated, and as easily reduced. The bones of the arm and thigh are more subject to fracture than any other of the extremities; the first is easily cured, because the arm can be kept from being moved; but a fracture in the thigh-bone is a much more troublesome case, because, over and above the difficulty of keeping the bones in a proper situation, the part is often necessarily moved in cleaning the child. In this case, the best method is to keep the child lying on one side after the thigh hath been secured by proper bandage, so that the nurse may change the cloth without moving the part, and to lay it upon bolsters or pillows raised above the wet-nurse, that it may suck with greater freedom; if any of the bones are bent, they may be brought into their proper form by a slow, gentle, and proper extension.

The navel-string must be wrapped in a soft linen rag and folded upon the belly, over which is to be laid a thick compress, kept moderately tight with a bandage commonly called a *belly-band*. This compression must be continued for

some time, in order to prevent an exomphalus or rupture at the navel, and kept tighter and longer on children that are addicted to crying than on those that are still and quiet, yet not so tight as to be uneasy to the child, and the bandage must be loosened and the part examined every second day. The navel-string shrinks, dies, and about the sixth or seventh day commonly drops off from the belly, though not at the ligature as some people have imagined. This being separated, a pledget of dry lint must be applied to the navel, and over it the thick compress and bandage, to be continued for several weeks, for the purpose mentioned above.

During the time of washing and dressing the child it ought to be kept moderately warm, especially in the head and breast, that the cold air may not obstruct perspiration; the head and body ought also to be kept tolerably tight with the cloths for the convenience of handling, and to prevent its catching cold, especially if the child be weakly; but if it be vigorous and full grown it cannot be too loosely clothed, because the brain, thorax, and abdomen suffer by too great compression. The clothing of new-born children ought also to be suitable to the season of the year and the nature of the weather, the extremes of cold and heat being avoided as equally hurtful and dangerous. Instead of the many superfluous inventions of nurses, and those who make clothes for children with a view to make an expensive and pompous appearance, the dress ought to be contrived with all imaginable simplicity. The child being washed, the navel-string secured, and the head covered with a linen or woollen cap as already directed, a shirt or waistcoat may be put upon the body, and over it a flannel skirt or petticoat, open before, with a broad head-band, as commonly used, or rather a waistcoat joined to it, so that they can be put on at once; this ought to be rather tied than pinned before, and instead of two or more blankets, may be

covered with a flannel or fustian gown; while the head is accommodated with another cap, adorned with as much finery as the tire-woman shall think proper to bestow.

In short, the principal aim of this point is, to keep the child's head and body neither too tight nor too slovenly, too hot nor too cold; that it may be warm, though not over-heated; and easy, though not too loose; that respiration may be full and large; that the brain may suffer no compression; and that while the child is awake the legs may be at liberty; to reject all unnecessary rollers, cross-cloths, neck-cloths, and blankets; and to use as few pins as possible, and those that are absolutely necessary with the utmost caution.

[In this last sentence, as well as in the advice previously given, about washing the child (viz. to use milk and water or soap and water in preference to the compounds then in vogue for the purpose), we can discern the strong common sense of Smellie, and his indifference to traditional usages. Some of the excellent precepts, so forcibly inculcated by the ironical pen of Albert Smith, in his little work 'How to make Home Unhealthy,' are here anticipated by Smellie.]

Sect. 2.—*How to Manage when the Common Passages are Locked Up or the Tongue Tied.*

When the child cannot make water, because the passage is filled up with mucus, after having unsuccessfully practised the common methods of holding the belly near the fire and rubbing the parts with *Ol. Rutæ*, &c., we must introduce a probe or very small catheter along the urethra into the bladder, an operation much more easily performed in female than in male children.

[I have occasionally known twelve, eighteen, and even twenty-four hours to elapse before any urine was voided by the infant. Applying

a sponge wrung out of warm water to the perineum, and then a cold smoothing iron to the soles of the feet, will sometimes make the bladder act when no obstruction exists in the passages.]

In boys, the prepuce alone is sometimes imperforated, in which case an opening is easily made. But if there is no passage in the urethra, or even through the whole length of the glans, all that can be done is to make an opening with a lancet or bistoury near the mouth or sphincter of the bladder in the lower part of the urethra, where the urine being obstructed pushes out the parts in form of a tumour; or, if no such tumefaction appears, to perforate the bladder above pubes with a trocar. This, however, is a wretched and ineffectual expedient, and the other can but at best lengthen out a miserable life. If the anus is imperforated, and the fæces protrude the parts, or if it be covered with a thin membrane, and a bluish or livid spot appears, the puncture and incision commonly succeed. But when the rectum is altogether wanting, or impervious for a considerable way, the success of the operation is very uncertain; nevertheless it ought to be tried, by making an artificial anus with a bistoury, remembering the course of the rectum and the entry in both sexes. For further information on this subject, Mauriceau's and Saviard's Observations, and the Memoirs of the Academy of Surgeons may be consulted.

In female children there is a thin membrane, in form of a crescent, called the *hymen*, that covers the lower part of the orifice of the vagina, and is rent in the first coition. The middle of it is sometimes attached to the lower part of the meatus urinarius, and on each side of the bridge is a small opening that will only admit of the end of a probe, though it is sufficient for the discharge of the menses. This obstruction is commonly unknown till marriage, and hath often proved fatal to the unfortunate woman who had concealed it through the excess of modesty, and afterwards

sunk into a deep melancholy which cost her her life, rather than submit to examination, and the easy cure of having the attachment snipt with a pair of scissors. On this consideration, Saviard advises all accoucheurs to inspect this part in every female child they deliver, and if there should be such a defect to remedy it during her childhood; or, if the entry is wholly covered with the membrane, let a sufficient perforation be made, which will prevent great pain and tension in their riper years, when the menses, being denied passage, would accumulate every month, and at last push out this and the neighbouring parts in form of a large tumour, the cause of which is generally unknown until it be opened.

Sometimes a thin membrane, rising from the under part of the mouth, stretches almost to the tip of the tongue, bracing it down, so as to hinder the child from taking hold of the nipple and sucking. This disorder, which is called *tongue-tying*, is easily remedied by introducing the forefinger into the child's mouth, raising up the tongue, and snipping the bridle with a pair of scissars.

If, instead of a thin membrane, the tongue is confined by a thick fleshy substance, the safest method is to direct the nurse to stretch it frequently and gently with her finger; or, if it appears like a soft fungus, to touch it frequently and cautiously with lunar caustic or Roman vitriol (sulphas cupri); but we ought to take care that we are not deceived by an inflammation that sometimes happens in the birth, from the accoucheur's helping the head along with his finger in the child's mouth.

Sect. 3.—*Of Mould-shot Heads, Contusions, and Excoriations.*

In laborious and lingering labours the child's head is often long confined, and so compressed in the pelvis that the bones of the upper part of the cranium are squeezed together, and ride over one another in different manners, according as the head presented. If the ossa parietalia rise over the os frontis the case is called the *mould-shot;* if over the occiput, it goes by the name of the *horse-shoe mould.* When the fontanel presents (though this is seldom the case), and is pushed down, the form of the head is raised up in the shape of a hog's back; whereas, in the former case, the vertex or crown of the head presented, and the whole was turned from a round to a very long figure. If the head is kept long in the pelvis, and the child not destroyed by the compression of the brain, either before or soon after delivery, it commonly retains more or less of the shape acquired in that situation, according to the strength or weakness of the child. When the bones begin to ride over one another in this manner, the hairy scalp is felt lax and wrinkled; but, by the long pressure and obstructions of the circulating fluids, it gradually swells and forms a large tumour.

In these cases, when the child is delivered, we ought to allow the navel-string, at cutting, to bleed from one to two or three spoonfuls, especially if the infant be vigorous and full grown, and to provoke it by whipping and stimulating, for the more it cries the sooner and better are the bones of the cranium forced outwards into their natural situation; or, if the head hath not been long compressed, and is not much inflamed, we can sometimes with our hands reduce it into its pristine shape. The meconium ought also to be purged off as soon as possible, to give freer scope to the

circulating fluids in the abdomen, and make a revulsion from the surcharged and compressed brain. This may be effected with suppositories, glysters, repeated doses of *Ol. Amygdal. d.* mixed with *Pulv. Rhei* or *De Althæa*, or *Syr. de Cichoreo, cum Rheo.*

If the child is seized with convulsions soon after delivery, in consequence of this compression, and the vessels of the navel-string have not been allowed to bleed, the jugular vein ought to be immediately opened, and from one to two ounces of blood taken away—an operation easily performed in young children; the urine and meconium must be discharged, and a small blister applied between the scapulæ. When the scalp is bruised, inflamed, or swelled, let it be anointed or embrocated with a mixture of *Ol. Chamomel. Acet.* and *Spt. Vin. camphorat.* and cerates and poultices applied to the parts.

[I have found no application so satisfactory for these, or any other abrasions of a like kind in young infants, as the *Linimentum Calcis* of the pharmacopœia. When the face of the child presented and the labour had been difficult or prolonged, the features are sometimes very much swollen and chafed at birth; and here the above liniment forms a very admirable dressing, frequently applied over the surface.]

If the tumefaction is large, and we feel a considerable fluctuation of extravasated fluids, which cannot be taken up by the absorbent vessels, assisted with those applications, the tumour must be opened; though generally there is no occasion for a large incision, because, after the fluid is once discharged, the hollow scalp, by gentle pressure, is more easily joined in children than in older subjects.

[The scalp tumours here alluded to (and which in more modern works are described under the name of *cephalæmatomata*) often contain a bloody fluid. They are generally removed by absorption, and this will be promoted by the use of a discutient lotion of vinegar, spirit, muriate of ammonia, and rose water, in suitable propor-

tions. Sometimes several weeks may elapse before the swelling is dispersed. Very seldom have I found it necessary to puncture them; and if this necessity arise, it should be done with the aspirator and a very fine trocar. Since the practice of an early employment of the forceps has become established, the occurrence of these scalp tumours is very rarely met with.]

When the head is misshapen it should not be bound or pressed, but left lax and easy, lest, the brain being compressed, convulsions should ensue.

The body of the child is sometimes covered all over with little red spots called the *red gum*, and commonly proceeding from the costiveness of the child, when the meconium hath not been sufficiently purged off at first. And here it will not be improper to observe that, as the whole tract of the colon is filled with this viscid excrement, which hath been gradually accumulated for a considerable time, and as the small intestines, stomach, and gullet are lined with a glairy fluid or mucus, the child ought to take no other nourishment than pap as thin as whey, to dilate this fluid, for the first two days; or, indeed, till it sucks the mother's milk, which begins to be secreted about the third day, and is at first sufficiently purgative to discharge these humours, and better adapted for the purpose than any artificial purge.

If the mother's milk cannot be had, a nurse lately delivered is to be found; and if the purgative quality of her milk is decreased, she must be ordered to take repeated small doses of manna or lenitive electuary, by which it will recover its former virtue, and the child be sufficiently purged.

If the child is brought up by hand the food ought to imitate as near as possible the mother's milk; let it consist of loaf-bread and water boiled up together in form of panada, and mixed with the same quantity of new cow's milk, and sometimes with the broth of fowl or mutton.

When the child is costive two drachms of manna, or from two to four grains of rhubarb may be given; and when the stools are green and curdled it will be proper to absorb the prevailing acid with the testaceous powders, such as the *Chel. Cancror. simp.* or *Test. Ostrear.*, given from the quantity of ten grains to a scruple; and for this purpose the *Magnesia alba* is recommended, from one to two drachms a day, as being both opening and absorbent. The red gum may likewise proceed from the officiousness of the nurse, by which the scarf skin hath been abraded or rubbed off; in which case the child must be bathed in warm milk, and the parts softened with pomatum; the same bath may be also used daily in the other kind, and the belly kept open with the aforementioned medicines; with which some syrup, tincture, or powder of rhubarb, may be mixed or given by itself, if the stools are of a greenish hue.

Excoriations behind the ears, in the neck, and groin of the child, are sometimes, indeed, unavoidable in fat and gross habits, but most commonly proceed from the carelessness of the nurse, who neglects to wash and keep the parts clean; they are, however, easily dried up and healed with *Unguent. Alb. Pulv. e Cerussa,* or fuller's earth. Yet we ought to be cautious in applying drying medicines behind the ears, because a discharge in that part frequently prevents worse diseases.

[The *Unguentum Album* was composed of olive oil, white wax, and spermaceti; and the *Pulvis e Cerussâ* had for its ingredients, cerussa (or carbonate of lead), powdered sarcocol (an astringent resinous matter), and gum tragacanth. Neither of these preparations can be recommended; but the fuller's earth, properly prepared and sifted, is very efficacious for abrasions. I have also found the lycopodium powder (or pollen of the club moss) a most excellent application; it may advantageously be mixed with some prepared chalk and some finely powdered starch, or arrowroot. The "violet powder," ordinarily sold as a dusting powder for

infants, answers very well as a preventive of scalding; but when this has occurred the violet powder often proves irritating, and then the lycopodium powder just mentioned, or the prepared fuller's earth is preferable. In very bad or obstinate abrasions, weak black wash (half a grain of calomel to the fluid ounce of lime water), or a weak lotion of sulphate of zinc (three grains to the ounce), may be tried.]

Sect. 4.—*Of the Aphtha.*

The aphtha or thrush is a disease to which new-born children are frequently subject, and is often dangerous when neglected at the beginning. This disease proceeds from weakness and laxity of the contracting force of the stomach and intestines, by which the acescent food is not digested, and from a defect in the necessary secretion of bile, with which it ought to be mixed. This prevailing acid in the primæ viæ produces gripings and loose green stools, that weaken the child more and more, deprives it of proper nourishment and rest, and occasions a fever from inanition and irritation. The smallest vessels at the mouths of the excretory ducts in the mouth, gullet, stomach, and intestines, are obstructed and ulcerated in consequence of the child's weakness, and acrimonious vomitings, belchings, and stools, and little foul ulcers are formed.

These first appear in small white specks on the lips, mouth, tongue, and at the fundament; they gradually increase in thickness and extent; adopt a yellow colour, which in the progress of the distemper becomes duskish, and the watery stools (called the *watery gripes*) become more frequent. The whole inner surface of the intestines being thus ulcerated and obstructed, no nourishment enters the lacteal vessels; so that the weakness and disease are increased, the milk and pap which are taken in at the mouth passes off curdled and green, the child is more and more enfeebled, and the brown colour of the aphtha declares a mortification

and death at hand. Sometimes, however, the aphthæ are unattended by the watery stools; and sometimes these last are unaccompanied with the aphtha.

In order to prevent this fatal catastrophe, at the first appearance of the disorder we ought to prescribe repeated doses of testaceous powders to absorb and sweeten the predominant acid in the stomach, giving them from ten to twenty grains in the pap, twice or three times a day; and on every third night, from three to five grains of the *Pulv. Rhei, Jalap. c. Creta;* oily and anodyne glysters, with epithems to the stomach, may also be administered. When these and every other prescription fail, the child, if not much weakened, is sometimes cured by a gentle vomit, consisting of *Pulv. Ipecacuan.* gr. I, given in a spoonful of barley-water, and repeated two or three times at the interval of half an hour between each. When the child is much enfeebled, the *Oleo-Saccharum Cinnamomi* or *Anisi,* mixed with the pap, is sometimes serviceable. If the milk is either too purgative or binding, the nurse should be changed, or take proper medicines to alter its quality; or, if the child has been brought up by hand, women's milk may be given on this occasion, together with weak broths; but if the child cannot suck, the milk of cows, mares, or asses may be substituted in its room, diluted with barley-water.

[The affection here described under the name of aphtha is the muguet of modern authors,—a complaint essentially different from true aphtha; and to the former of these (muguet) Dr. West restricts the use of the popular term *thrush.* The wide difference existing between these two disorders was not recognised for over half a century after Smellie's death. His outline of the symptoms is very brief, but correct so far as it goes.]

Sect. 5.—*Of Teething.*

Children commonly begin to breed their fore-teeth about the seventh, and sometimes not before the ninth month; nay, in some the period is still later. Those who are healthy and lax in their bellies, undergo dentition easier than such as are of a contrary constitution. When the teeth shoot from their sockets, and their sharp points begin to work their way through the periosteum and gums, they frequently produce great pain and inflammation, which, if they continue violent, bring on feverish symptoms and convulsions, that often prove fatal. In order to prevent these misfortunes, the swelled gum may at first be cut down to the tooth, with a bistoury or fleam; by which means the patient is often relieved immediately; but if the child is strong, the pulse quick, the skin hot and dry, bleeding at the jugular will be also necessary, and the belly must be kept open with repeated glysters. On the other hand, if the child is low, sunk, and emaciated, repeated doses of *Spt. Cor. Cerv.*, *Tinct. Fuligin.*, and the like, may be prescribed; and blisters applied to the back, or behind the ears.

CHAPTER III.

OF THE REQUISITE QUALIFICATIONS OF ACCOUCHEURS, MIDWIVES, NURSES WHO ATTEND LYING-IN WOMEN, AND WET AND DRY NURSES FOR CHILDREN.

SECT. I.—*Of the Accoucheur.*

THOSE who intend to practise Midwifery, ought first of all to make themselves masters of anatomy, and acquire a competent knowledge in surgery and physic; because of their connection with the obstetric art, if not always, at least in many cases. He ought to take the best opportunities he can find of being well instructed; and of practising under a master, before he attempts to deliver by himself.

In order to acquire a more perfect idea of the art, he ought to perform with his own hands upon proper machines, contrived to convey a just notion of all the difficulties to be met with in every kind of labour; by which means he will learn how to use the forceps and crotchets with more dexterity, be accustomed to the turning of children, and consequently be more capable of acquitting himself in troublesome cases that may happen to him when he comes to practise among women; he should also embrace every occasion of being present at real labours; and, indeed, of acquiring every qualification that may be necessary or convenient for him in the future exercise of his profession. But, over and above the advantages of education, he ought to be endowed with a natural sagacity, resolution, and prudence; together with that humanity which adorns the owner, and never fails of being agreeable to the distressed patient; in consequence of this virtue, he will assist the

poor as well as the rich, behaving always with charity and compassion. He ought to act and speak with the utmost delicacy of decorum, and never violate the trust reposed in him, so as to harbour the least immoral or indecent design; but demean himself in all respects suitable to the dignity of his profession.

[All the requisites, medical, moral, and ethical, of the accoucheur are here tersely noticed, and it would, perhaps, be impossible to say more on this subject in the same compass. Upon each of these three heads the observations of our author are most just and apposite. Some further remarks on the same subject are contained in the latter part of the following section.

In this more than in any other walk of the profession the practitioner has need, when at the bedside of the patient, to be most guarded in his conversation, and watchful of his conduct and gesture, so quick are the susceptibilities of puerperal patients, and so great the effects that an uncautious observation may produce upon them.]

Sect. 2.—*Of the Midwife.*

A midwife, though she can hardly be supposed mistress of all these qualifications, ought to be a decent sensible woman, of a middle age, able to bear fatigue; she ought to be perfectly well instructed with regard to the bones of the pelvis, with all the contained parts, comprehending those that are subservient to generation; she ought to be well skilled in the method of touching pregnant women, and know in what manner the womb stretches (*or enlarges*), together with the situation of all the abdominal viscera; she ought to be perfectly mistress of the art of examination in time of labour, together with all the different kinds of labour, whether natural or preternatural, and the methods of delivering the placenta; she ought to live in friendship with other women of the same profession, contending with

them in nothing but in knowledge, sobriety, diligence, and patience; she ought to avoid all reflections upon men-practitioners; and when she finds herself at a loss, candidly have recourse to their assistance. On the other hand, this confidence ought to be encouraged by the man, who, when called, instead of openly condemning her method of practice (even though it should be erroneous), ought to make allowance for the weakness of the sex, and rectify what is amiss, without exposing her mistakes. This conduct will effectually conduce to the welfare of the patient, and operate as a silent rebuke upon the conviction of the midwife; who, finding herself treated so tenderly, will be more apt to call for necessary assistance on future occasions, and to consider the accoucheur as a man of honour and a real friend. These gentle methods will prevent that mutual calumny and abuse which too often prevail among the male and female practitioners; and redound to the advantage of both; for no accoucheur is so perfect but that he may err sometimes; and on such occasions he must expect to meet with retaliation from those midwives whom he may have roughly used.

[The latter part of this section (which properly belongs to the preceding one) shows the good sense and sound policy of Smellie, and receives illustrations from his own conduct on various occasions where, in the course of practice, he was brought into contact with the female obstetricians. Cases 314, 315, 527, 531, &c., show us that the principles he here lays down were strictly acted upon by him; and no doubt his calm, dignified, and yet considerate way of dealing with the *feminine* (?) practitioners was in every respect the wisest and best that could have been pursued under the circumstances; for, while it took for granted the superiority of the doctor, it yet did not irritate the feelings, or provoke the hostility of the midwives. This rivalry between male and female obstetricians may ere long be revived; but they will then compete on more equal terms as regards information and acquirements. I am grievously mistaken, however, if it will not be demonstrated by experience, that although in ordi-

nary cases the *Doctress* may acquit herself satisfactorily, yet in trying emergencies, where self-possession, physical strength, and nerve are indispensably needed, she will prove incompetent ; as by her essential and peculiar constitution she possesses these important qualifications in smaller measure than does the other sex.]

Sect. 3.—*Of Nurses in general.*

Nurses, as well as midwives, ought to be of middle age, sober, patient, and discreet, able to bear fatigue and watching, free from external deformity, cutaneous eruptions, and inward complaints that may be troublesome or infectious.

Numb. 1.—*Nurses for Women in Childbed.*

Nurses that attend lying-in women ought to have provided, and in order, everything that may be necessary for the woman, accoucheur, midwife and child ; such as linen and clothes, well-aired and warm, for the woman and the bed, which she must know how to prepare when there is occasion, together with nutmeg, sugar, spirit of hartshorn, vinegar, Hungary water, white or brown caudle ready made, and a glyster-pipe fitted. For the use of the accoucheur she must hang a doubled sheet over the bedside, and prepare warm cloths, pomatum, thread, warm and cold water, and two hand-basins, and for dressing the child she must keep the cloths warm and in good order. After delivery her business is to tend the mother and child with the utmost care, and follow the directions given to her relating to the management of each.

[The functions belonging to the nurses here described are now discharged by "monthly nurses," or "ladies' nursetenders," who also possess a certain amount of obstetric knowledge, enough at all events to enable them to understand the progress of labour, and to conduct ordinary cases of delivery. To give them a higher degree

of instruction has not been thought advisable in these countries, considering their want of general medical education, as well as their natural incapacity for the graver responsibilities of midwifery practice. At the Dublin Lying-in hospital (where a school for these women has been in active operation for nearly a hundred years) the training of midwives, or monthly nurses, lasts for six months, and they are thoroughly taught the mode of conducting ordinary labours, and the nursing required by the mother and child during the puerperal period; but beyond this their instruction chiefly goes to teaching them how to recognise the serious deviations from natural labour and from normal convalescence, so that they may know when to give timely intimation of the necessity for medical assistance. Thus the negative training is not less important than the positive: for while the latter teaches them how far they can act on their own responsibility, the former points out to them the line beyond which they cannot safely venture. The King and Queen's College of Physicians in Ireland have taken the lead in granting a diploma to women of this class, who pass an examination in "midwifery (not including operations) and nursetending." The diploma states that "The President and Fellows of the King and Queen's College of Physicians in Ireland, *having duly examined in Midwifery and Nursetending, and having found her to possess a competent knowledge of the same, do truly licence and authorise the said to exercise the calling of a midwife and nursetender.*"]

That the mother herself should give suck would certainly be most conducive to her own recovery, as well as to the health of the child; but when this is inconvenient or impracticable, from her weakness or circumstances in life, a wet nurse ought to be hired, possessed of the qualifications above described as well as of those that follow.

Numb. 2.—*Wet Nurses.*

The younger the milk is, the better will it agree with the age of the infant. The nurse is more valuable, after having brought forth her second child than after her first;

because she is endued with more knowledge and experience touching the management of children.

[There is another reason—one of a physiological nature—why women on their first children are not so desirable for wet nurses; and it is this, that the catamenia generally return at an earlier period in lactation after a first than after a subsequent confinement.[1] Although I do not lay it down as an absolute rule that a wet nurse is disqualified by the return of menstruation, yet such is often the case; and once she begins to menstruate she is liable to conception, the occurrence of which is, beyond all question, a very cogent reason for the child being taken from her breast.]

She ought to have good nipples, with a sufficient quantity of good milk; the abundance or scantiness of the secretion may be distinguished by the appearance of her own child; and the quality may be ascertained by examining the milk, which she may be ordered to pour into a wine glass, about two or three hours after she hath eaten and drank, and suckled her own child. If, when falling in a single drop upon the nail, it runs off immediately, the milk is too thin; if the drop stand in a round globe, it is too thick; but when the drop remains in a flattened form, the milk is judged to be of a right consistence; in a word, it may be as well distinguished by its opacity or transparency, when it is dashed upon the side of the glass; besides, it ought to be sweet to the taste, and in colour inclining to blue rather than to yellow. Red-haired women, or such as are very fair and delicate, are commonly objected to in the quality of nurses; but this maxim is not without exceptions; and on this subject Boerhaave's Institutes, with Haller's Commentary, may be consulted.

[1] Careful statistical research might not, perhaps, bear out the above statement as to the earlier return of the menses after first labours. I have not myself tested its correctness by this method, nor am I acquainted with any author who has done so. In the absence of any such conclusive evidence to the contrary, I shall continue to hold the opinion above expressed.

Although it is certainly most natural for children to suck, it may be sometimes necessary to bring them up by hand; that is, nourish them with pap; because proper wet nurses cannot always be found, and many children have suffered by sucking diseased women. Some can never be brought to suck, although they have no apparent hindrance; and others are prevented by some swelling or disorder about the mouth or throat.

Numb. 3.—*Dry Nurses.*

Upon such occasions, we must choose an elderly woman properly qualified for the task, and well accustomed to the duties of a dry nurse. The food (as we have formerly observed) ought to be light and simple, in quality resembling as nearly as possible the mother's milk, such as thin panada mixed with cow's milk and sweetened with sugar; or, should the child be costive, instead of sugar, honey or manna may be used. If there is any reason to believe that the loaf-bread or biscuit is made of flour which hath been mixed with alum for the sake of the colour, the common panada ought in this case to be laid aside, in favour of thick water-gruel, mixed with milk, and sweetened as above.

Some children thrive very well on this diet; but when it is neither agreeable to their palates nor nourishing, a wet nurse must be procured, before the child is too much emaciated and exhausted; and if it can suck, the good effects of the milk will soon be manifest. But, for further information on his head, the reader may consult Dr. Cadogan's Letter on Nursing of Children.

[The subject of the rearing of infants artificially—or "by hand," as it is termed—is every year assuming more and more importance both from the greater difficulty of procuring wet nurses, and the increasing objection, on social and moral grounds, to the practice of

hiring women for this purpose. If it be important in the selection of a wet nurse that she should have a high standard of physical health and development, not less important is it that a dry nurse charged with the rearing of the infant should have superior intelligence, and a practical acquaintance with the duties she is about to undertake. Such a description of servant is not very easily obtainable, and moreover is expensive; hence while rearing by hand often succeeds in the wealthier ranks of society, yet among the poor it generally results in the death of the child from diarrhœa, thrush, atrophy, or dentition with its consequences.

Smellie speakes highly of pap, or panada for the child; but till it is some months old, milk must be the staple article of its diet; and farinaceous food (of which there are several varieties at the present day, and many of them most excellent), given very sparingly and cautiously. Not only must the quality of the food be considered in artificial feeding, but the temperature, quantity, and times of giving it, require to be most carefully attended to. In many of the children with whom the attempt to rear by hand fails, the cause of failure lies not so much in the quality of the food as in its being given too largely or at too short intervals.

Even with the utmost care and judgment some infants do not thrive on artificial food, and to persevere in the attempt exposes them to almost certain destruction. This intolerance of artificial food I have often had occasion to observe where one or both parents was dyspeptic. In such cases as this a wet nurse must be procured at any cost. The symptoms which should make us consider this change to be peremptorily called for would be flatulence, diarrhœa, frequent crying, and wasting. In the absence of diarrhœa we may persevere much longer in our attempts to nourish the child by spoon or bottle.

The use of a feeding bottle is much superior to the spoon or to the pap boat; the child is not so likely to take too much at a meal, and there is more admixture of saliva.

Maw's feeding bottle, which has a long india-rubber tube connecting it with the artificial nipple, possesses this great advantage, namely, that the infant can feed itself as it lies in the bed or cradle, and this, I admit, is a great convenience and saving of trouble, especially to the poor woman who has many household duties to perform; but the temptations it affords to over-feeding is, I fear, too often irresistible: on many occasions I have been able to trace

serious gastric ailments to this source alone, and not to the quality of the food. On this point I cannot forbear quoting the remarks of a recent writer, they are so apposite and so strongly put:

"The present system of laying an infant down with the bottle is a mere excuse for idleness. A child should be fed in the arms of the nurse and constantly watched while feeding, the supply of food carefully regulated, in order that it may be taken in a natural manner, and, after feeding, the child may be laid down, but not with the bottle, which is one of the most injurious and pernicious introductions of modern times. The ancient feeding-bottles, that necessitated the constant attention of the nurse, should alone be allowed, and we should much less frequently hear of the failure of the most natural food, milk, supplying every element for the effectual and comfortable nutrition of the child." (Dr. S. Prall, in 'Brit. Med. Jour.,' Oct. 14, 1876.)

The bottle I generally recommend is Gilbertson's. It has a glass tube, through which the milk is conveyed, passing from the bottom out through the stopper, where provision exists for attaching the nipple to the extremity of the tube.

The feeding bottle was a most valuable acquisition to our means of artificial rearing, being far superior to the spoon, boat, horn or "feeding pot" so strongly recommended by Dr. Michael Underwood; though it is but just to add, that this last contrivance possessed one of the chief advantages of the bottle, viz. with it the child sucked in the food by its own efforts. A wide-spread popular prejudice exists against giving the child cows' milk and breast milk at the same time, on the ground that "the two milks will disagree;" but I never could see any real grounds for this notion: if each by itself agrees with the child, so will the two.

The letter of Dr. William Cadogan to which Smellie refers his readers was addressed to a governor of the Foundling Hospital, London, to which institution Cadogan was physician. The title of this letter is "An Essay upon the Nursing and Management of Children from their birth to three years of age." This remarkable essay, of which nine or ten editions issued from the press, initiated a great and much needed reformation in the management and dietetics of infancy. In fact, up to this time the direction of the nursery was ignored by the Faculty, and left to the absolute control of the nurses and other *experienced matrons*. Cadogan showed the folly of all this, and did much good by exposing the gross errors and hurtful

tendency of the system then pursued in the rearing of infants. Superior to the influence of custom, and rejecting the maxims of tradition, he viewed the whole matter in the light of physiology and common sense; and great were the benefits which resulted. Like most reformers, however, Cadogan carried his views a little too far, and too strongly defended abstinence and reliance upon nature. Underwood's celebrated Treatise on the Diseases of Childhood, &c., appeared in 1784, and he advocated with great ability and success the principles which Cadogan had contended for. Since that time not only have the diseases of early childhood come under the exclusive care of the obstetric physician, but all questions affecting the general hygiene and dietetics of infancy are referred to his authority for decision.]

END OF VOL. I.

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